ALESIS
SR-16

Reference Manual

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CHAPTER 1: INTRODUCTION

1.1 WELCOME TO THE SR-16 DRUM MACHINE!

1.1A If You Just Can't Wait...

Turn to section 1.4, *10 Steps to Instant Gratification*, and start making sounds. Some of the terms in that section may not make sense, but just follow the instructions, and get ready to hear some great grooves and have a good time. When you're ready to learn more, return to the beginning to learn SR-16 basics.

The goal of the SR-16's design team has been to create a musical instrument, not a computer that happens to make sounds. They thank you for your confidence in this product, and hope that you find the SR-16 a rewarding tool for self-expression that stimulates your creativity (and tickles your fancy).

1.1B SR-16 Quick Description

The SR-16 includes over 230 high-fidelity drum/percussion sounds, and is easy to operate. As you tap the 12 drum pads (each of which can be assigned to any of the available sounds), the SR-16's on-board computer records exactly when you triggered the drum sound and the dynamics of your playing. You can play back the part, and edit it in various ways.

Data is retained in memory even if the power is turned off. If the memory fills up with drum Patterns and Songs, this data can be saved permanently to standard cassettes, or to MIDI System Exclusive storage devices.

The SR-16 also includes a library of preset rhythm Patterns prepared by professional drummers for those who want to start creating Songs in the fastest and easiest way possible.

1.1C About this Manual

The manual takes you through every function of the SR-16 in the following order:

1. Introduction: Gives the basic ground rules and also covers how to play back drum parts.
2. Record Setup: Tells how to set up the SR-16 to record and edit drum parts.
3. Playing Back and Recording Drum Patterns: Put theory into practice and come up with some drum parts. Includes material on copying and erasing.
4. Creating and Modifying Drum Sets: The SR-16 includes 50 Preset "drum sets" with particular choices of sounds, tuning, panning, level, etc. However, you can also create and modify your own. Each Pattern can have its own associated Drum Set .
5. Song mode: Now that you have a bunch of Patterns, string them together into Songs.
6. MIDI Setup: Here's how to use the SR-16 as part of a MIDI system.
7. Backup: Now that you've come up with some great Songs and rhythm Patterns, it's time to save them to a cassette recorder or MIDI system exclusive storage device.

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8. Applications: This additional information will help you get the most out of the SR-16.
9. MIDI Supplement: This brief, entry-level explanation of MIDI explains the basic theory behind the MIDI protocol.

Feel free to cover topics in a different order. For example, if creating a whacked-out Drum Set is important to you, read the Drum Set section before you start recording. If you come up with a great tune, skip ahead to the Backup section so that you don't accidentally erase the tune or otherwise lose it. If you only want to use the SR-16 as a MIDI expander module, then the MIDI Setup section might be a priority.

Experts as well as beginners should read the following "ground rules" (definitions, concepts, and how to communicate with the SR-16) very carefully. The SR-16 is easy to use, but only if you read and understand these basic principles.

Certain subjects, such as quantization and output assignments, will be familiar to experienced drum machine users but new concepts to others. As a result, some sections contain background material tailored specifically for beginners. These sections are identified as "background" and set in a smaller type size.

1.1D Return Your Warranty Card Now!

Your warranty will be in effect and you will receive product update information only if you send in your warranty card. See the back page of the manual for full warranty information.

1.2 GROUND RULES

The SR-16 drum machine consists of two main elements:

• The drum sounds themselves, recorded using16-bit resolution (the same resolution as CDs). For additional realism, many sounds use advanced "dynamic articulation" techniques so that these sounds, when hit loudly, have a different timbre than when they're hit softly.
• An internal computer to control and trigger the sounds. This computer simulates an advanced, easily editable tape recorder.

The SR-16 offers two main modes, *Perform* (for playback) and *Compose* (for recording). You can switch between these while the SR-16 is playing, making it easy to test out different sounds without recording them and then drop back into record mode.

1.2A The Pattern/Song Recording Method

When recording with a drum machine, it's often easier to divide a song into shorter individual *Patterns* and work on these rather than record an entire song. A typical Pattern might be 8,16, or 32 beats long, and correspond to a verse, chorus, bridge, instrumental, intro, etc. While recording these Patterns, the SR-16 will be in *Pattern mode*. The SR-16 holds 50 Preset *(i.e.,* can't be edited) Patterns and 50 user-programmable Patterns, each of which can be from 1 to 128 beats long.

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After perfecting these Patterns, *Song mode* offers two ways to create a song:

- Program a list of Patterns, in the order in which they are to be played.
- Select Patterns in real time, and the SR-16 will remember your performance.

The SR-16 stores up to 100 User-programmable Songs.

Breaking a song into Patterns saves time since elements of a song often repeat. *Example:* The second verse might have the same drum pattern as the first verse. Rather than record the same Pattern twice, simply record one Pattern, then list it twice when assembling a Song. This also saves memory (thus leaving room for more Patterns and Songs) since listing a Song step takes up much less memory than recording a Pattern.

1.2B The Four Different Types of Patterns

The SR-16 introduces exciting new Song construction techniques. The SR-16 excels at live performance—something usually not associated with drum machines. The key to using these advanced features is understanding the different types of available Patterns.

- *Preset* Patterns provide a variety of rock, jazz, pop, and other rhythms programmed by professional drummers.

- *User* Patterns are Patterns you can program, edit, and save. The Preset/User button selects between these two master banks of Presets. The only way to modify a Preset Pattern is to copy it to a User Pattern, where it can be edited.

There are 50 of each type of Pattern, numbered 00-49. However, each numbered Pattern actually contains four different "sub-Patterns":

- A pair of independent *Main* Patterns (A and B, selected by their respective buttons).

- A pair of associated *Fill* Patterns (A Fill and B Fill, selected by pressing the FILL button when either A or B is selected). The Fills primarily provide transitional Patterns between Main Patterns, which makes for more realistic drum parts. The associated Fill Patterns share the same length, Drum Set, and name as their Main Patterns *(e.g.*, if A is 16 beats, A Fill is 16 beats). Otherwise, they are independent.

The reason for pairing the two different A and B Patterns together is simply so that you can switch back and forth between them rapidly in live performance or while improvising. However, A and B Patterns can be treated as completely independent Patterns if desired and can have different lengths, Drum Sets, etc.

Always think of the Main Pattern and its associated Fill as a unit. For example, if you copy a Main Pattern to another Main Pattern, its Fill will travel along with it.

Note that even though there are "only" 50 Patterns, the A and B variations double that to 100 Patterns, and the Fills double that again to 200 Patterns. Added to the Preset Patterns, 400 total Patterns are available.

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1.2C How "Looping" Simplifies Recording

To simplify recording in Compose mode, a Pattern will "loop" over and over again. *Example:* Suppose you want to record an 8-beat pattern. While recording, the pattern will record through all 8 beats, then immediately jump back to the beginning and continue recording through all 8 beats again. The SR-16 will remain in record mode, and continue to loop, until you press STOP or switch over to Perform mode. You will hear any previously-played parts as you record new parts.

You can also erase drum hits while the pattern is looping to correct for errors.

1.2D What's a Voice?

Each of the 12 large pads triggers a *voice*. A voice is a sound-generating element with several variable parameters: Drum sound, tuning, volume, output assignment (the voice's audio output can go to either one of two sets of stereo outputs, and furthermore, to anywhere within the stereo field of the chosen set of outputs), and MIDI note number.

Each pad is *velocity-sensitive:* the harder you hit the pad, the louder the drum sound assigned to the pad will play. Thanks to the dynamic articulation techniques mentioned earlier, the timbre will often change as well, just like "real" drums.

There are eight levels of pad volume resolution, from soft to loud. However, when using the SR-16 as a drum sound expander and triggering sounds via MIDI, they respond to all 127 MIDI volume levels.

1.2E About Defaults

A default is a setting that is automatically assumed until you purposely change it. *Example:* When you turn on a VCR, it automatically defaults to Stop—you have to purposely tell the machine to go into Record or Play. Stop is therefore the VCR's power-up default status.

The SR-16 includes a default setup that assigns particular drum sounds to particular voices (pads), at certain level and pan settings. The default drum sound assignments are printed in white on the pads. However, you can change these defaults and come up with any type of "drum set" you'd like.

Defaults save time by giving you a setup that's instantly ready to go; sometimes you'll need to change only a few parameters to customize the default setup to your liking.

Often the default is "whatever was selected last." *Example:* If the SR-16 was in Pattern mode and Pattern 23 was selected when you turned off the SR-16, the next time the SR-16 powers up it will be in Pattern mode with Pattern 23 selected.

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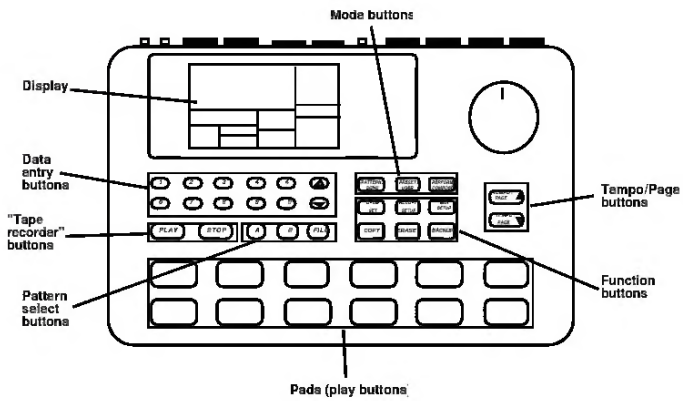
1.2F Physical Layout

The SR-16 includes seven main types of controls, along with a group of connectors (located on the back panel). The control groups (see diagram) are:

• *Pads (play buttons).* Tapping each button triggers an SR-16 voice.
• *Function buttons.* These six buttons select various functions, some of which include multiple "pages" of options.
• *Tempo/Page buttons.* These alter the tempo and also select different "pages" present in the Drum Set, Record Setup, MIDI Setup, and Backup functions.
• *Pattern select buttons.* These choose between the A, B, and Fill variations for a Pattern.
• *Mode buttons.* These choose between Pattern and Song modes, Perform (playback) and Compose (record) modes, and the Preset and User patterns.
• *"Tape recorder" buttons.* These control playback and stop, and work similarly to a tape recorder.
• *Display and data entry buttons.* The display informs you of the instrument's status, and also prompts you for data from time to time. A detailed description of the display follows shortly. The data entry buttons include number entry buttons (0-9) and up arrow (increment, or INC) and down arrow (decrement, or DEC). The latter increase or decrease parameter values on step at a time.
• *Huge volume knob.* If you're used to scratching a turntable, you'll love the feel of this knob. It regulates the volume of the entire unit.



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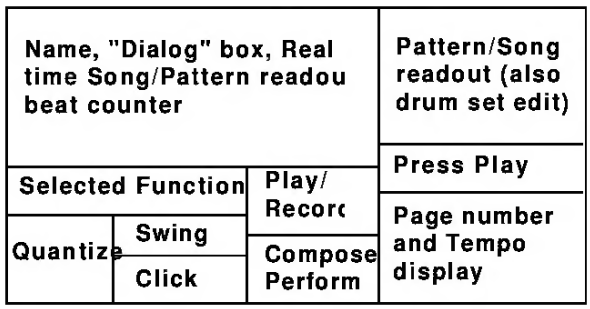
1.2G Display Layout

The LCD is divided into several "windows." Each window contains information that helps you monitor the SR-16's status, and/or indicates what type of data should be entered.

• *Name, "dialog" box, real time Song/Pattern readout, beat counter.* This is the most commonly-used area of the display. It shows Pattern and Song names, the beat counter if a Pattern or Song is playing, and the Pattern (including A/B/Fill/Preset or User designators) that is currently playing in Song mode. When acting as a "dialog box," it lists parameters and the value to be edited *(e.g.,* MIDI channel and the channel number).
• *Pattern/Song readout (also Drum Set edit and drum pad readout).* This shows the selected Song or Pattern number; with Patterns, the A/B/Fill/Preset or User designators are also shown. If you have edited a Drum Set to which a particular Pattern was assigned, the display also shows **DRUMSET EDITED**. In operations that require selecting a drum pad, this window displays the drum pad number.
• *Press PLAY.* For some operations, it is necessary to press the PLAY button to confirm a particular operation, such as copy or erase. This portion of the display will say **PRESS PLAY** if it is necessary to press PLAY to complete an operation.
• *Page number and tempo display.* When stopped or running, this shows the current tempo and includes a visual metronome block that flashes on the beat. For functions that have multiple "pages" of parameters (Drum Set, Record Setup, MIDI Setup, and Backup), this portion of the display shows the currently selected page number.
• *Compose/Perform.* This indicates whether the SR-16 is in Compose or Perform mode.
• *Click.* In Compose mode, shows the current click rhythm in standard music notation (or **OFF** if click is off).
• *Quantize.* In Compose mode, shows the current quantization rhythm in standard music notation (or **OFF** if quantization is off).
• *Selected function.* This shows which function is currently selected: Drum Set, Record Setup, MIDI Setup, Backup, or Step Edit.
• *Swing.* In Compose mode, shows the current swing rhythm, expressed as a percentage (or **OFF** if swing is off).
• *Play/Record.* If the SR-16 is playing and in Compose mode, this will say **RECORDING**. If the SR-16 is playing and in Perform mode, this will say **PLAYING**.



1.2H Text Protocols

Throughout the text, button names are shown in UPPER CASE and words that appear on the display are shown in **BOLD**. When referring to a numbered step in a set of steps, the step

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number will be in parenthesis—for example, step (4)—to prevent confusion with Song steps or step edit mode.

1.3 IMPORTANT: HOW TO COMMUNICATE WITH THE SR-16

1.3A Entering Numbers

The SR-16 identifies Patterns and Songs, as well as many other parameters, with numbers. You need to type in (enter) these numbers in a *specific way* (as described below).

1.3B The Cursor

When the SR-16 wants you to enter a number in the "Dialog" box, the display will show the previously-entered number (or the default number), and the first digit will have a small underline called the *cursor*. If the cursor is not present, the number is there for reference only. You are expected to enter something only if the cursor is present.

1.3C Leading Zeroes

If a value to be edited is a two-digit number, you must enter a two-digit number. If the number is a three-digit number, you must enter a three-digit number. If necessary, enter a leading 0 *(i.*e., a zero at the beginning of the number) to fill out the required number of digits. *Example:* The beat length is a three-digit number. To enter a beat length of 16, enter 016.

1.3D Automatic Revert

This feature may confuse you at first, but save you from potential problems as you become more familiar with the machine. If all the required digits of a number aren't entered within two seconds, the display will revert back to the previous number, with the cursor under the first digit of the previous number. This is handy because if you start to enter a new number, but then change your mind halfway through, you don't have to key in (or remember) the original number again—just wait two seconds, and the display will revert to the original setting.

1.3E The INC/DEC Buttons

The two small buttons with the up arrow and down arrow symbols (next to the number keys) are called the INC/DEC buttons respectively.

Pressing the INC button once increases the value of the *entire number* indicated by the cursor (not just a single digit) by one. Pressing the DEC button once decreases the value of the *entire number* indicated by the cursor (not just a single digit) by one. *Example:* If the display shows 00 and you want to enter 01, tap the INC button once.

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These buttons, and the TEMPO/PAGE buttons, also have a "scroll" feature. If you press *and hold* a button, after a short pause the display will either increment or decrement at a rapid rate.

1.3F Buttons that Toggle

The Mode buttons, FILL button, and several function buttons (DRUM SET, RECORD SETUP, MIDI SETUP, and BACKUP) "toggle" between two states. Each button press sets the switch to its alternate state. *Example:* Press the PATTERN/SONG button once to change from Pattern to Song; press again to change from Song to Pattern. *Example:* Press RECORD SETUP to call up the Record Setup menu; press RECORD SETUP again to get out of the Record Setup menu.

1.4 10 STEPS TO INSTANT GRATIFICATION (SETUP AND CHECKOUT)

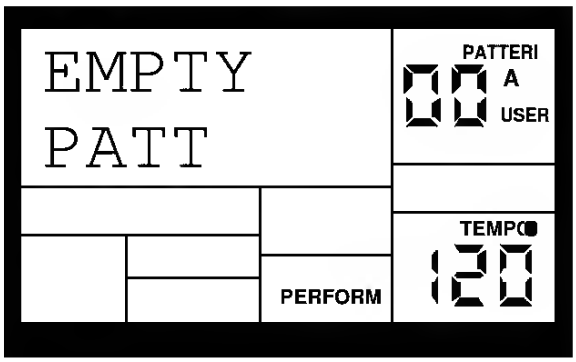
1. Connect the Main outputs (either left or right for a mono monitoring system, or both for stereo) to a high-quality musical instrument amplifier or PA. The amp and SR-16 volume controls should be all the way down (counter-clockwise).

2. Leave the MIDI jacks (rear panel) disconnected for now.

3. Plug the SR-16's AC adapter into the wall. The smaller plug inserts in the 9V AC Power jack on the back.

4. Turn on the rear panel On/Off switch, then turn on the amplifier.

5. The LCD will show a sign-on message. The upper right of the display should say **PATTERN** and not **SONG**; if it shows **SONG**, press the PATTERN/SONG button and the display will show **PATTERN**.



6. Start tapping the pads. Adjust the volume control for a comfortable listening level, and check out the sounds.

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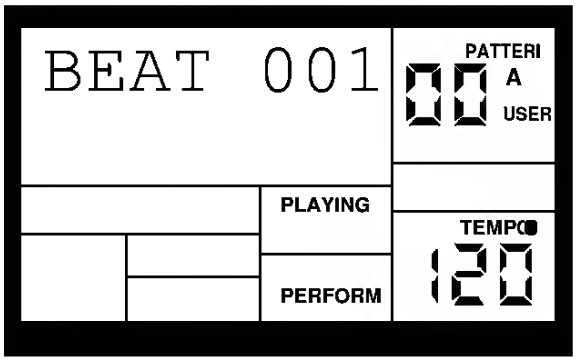
7. To hear the built-in demo, hold down the PATTERN/SONG button and press PLAY. To stop the demo, press STOP. If you want to play along with the demo, feel free to bash away on the pads.

8. Press PLAY, and you'll hear a Preset Pattern. (In case the SR-16 has already been played with, make sure that the display shows **PERFORM** and does *not* show **USER** before continuing. To choose Perform mode, press the PERFORM/COMPOSE button until the Perform/Compose section of the display shows **PERFORM**). To choose Preset rather than User Patterns, press the PRESET/USER button until the display does not show **USER**. If **USER** is not showing, then Preset Patterns are selected.



9. Try the following:

• Enter a two-digit number between 00-49 using the number keys, then press PLAY.

• Press the INC (up arrow) button to select the next higher-numbered Preset Pattern. It will play at the end of the current Pattern.

• Press the DEC (down arrow) button to select the next lower-numbered Preset Pattern.

• Press the B button to select the B variation of the selected Pattern.

• Press the A button to select the A variation of the selected Pattern.

• Press FILL briefly while a Main (A or B) Pattern is playing. Note how the Main Pattern switches from either A to B or B to A after the Fill has played.

• Press FILL and hold it down until *after* the Fill has played. If the FILL button is held down past the next downbeat, the Fill's associated Main Pattern (A or B) continues to play rather than switch from A to B or B to A.

• Press the TEMPO/PAGE buttons to change the tempo.

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CHAPTER 2: RECORD SETUP

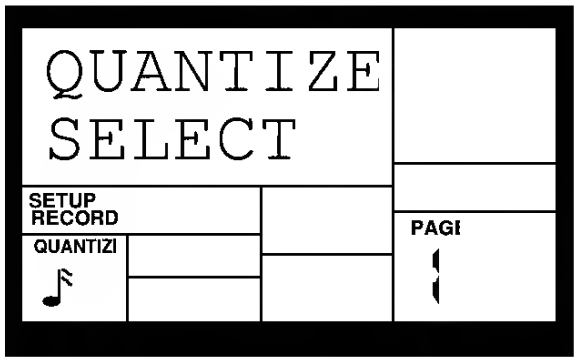
Several parameters are often adjusted prior to recording a Pattern, such as metronome, Pattern length, etc. General instructions are:

1. Press the RECORD SETUP button.
2. Use the PAGE (up and down) buttons to select different "pages" of functions; the display's lower right window shows the page number. These pages are described below.
3. Adjust values on pages, if necessary, as described for each page.
4. After making all needed changes, press RECORD SETUP again to exit, or choose another page.

One of the pages, Step Mode, contains several sub-pages.

2.1 PAGE 1: SELECT THE QUANTIZATION VALUE (QUANTIZE SELECT)

The display shows **QUANTIZE SELECT** and a note icon in the lower left Quantize window.



The note icon displays the quantization value in standard rhythmic notation. Enter the desired quantization value with the INC/DEC or number buttons (1 = quarter note, 2 = quarter note triplet, 3 = 8th note, 4 = 8th note triplet, 5 = 16th note, 6 = 16th note triplet, 7 = 32nd note, 8 = 32nd note triplet, 9 and 0 = Off, equivalent to 1/384th note resolution).

KEYPAD		NOTE VALUE		DISPLAY		NOTE NAME
1	=	1/4	=	♩	=	QUARTER NOTE
2	=	1/6	=	♩³	=	QUARTER NOTE TRIPLET
3	=	1/8	=	♪	=	EIGHTH NOTE
4	=	1/12	=	♪³	=	EIGHTH NOTE TRIPLET
5	=	1/16	=	𝅘𝅥𝅯	=	16th NOTE
6	=	1/24	=	𝅘𝅥𝅯³	=	16th NOTE TRIPLET
7	=	1/32	=	𝅘𝅥𝅰	=	32nd NOTE
8	=	1/48	=	𝅘𝅥𝅰³	=	32nd NOTE TRIPLET
9, 0	=	1/384	=	off	=	384th NOTE

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Quantization shifts your playing to the specified beat while you play, so choose the desired value before tapping out your rhythms. Remember that you can also change quantization while recording if, for example, you want to record snare with eighth note quantization but high-hats with 16th note quantization.

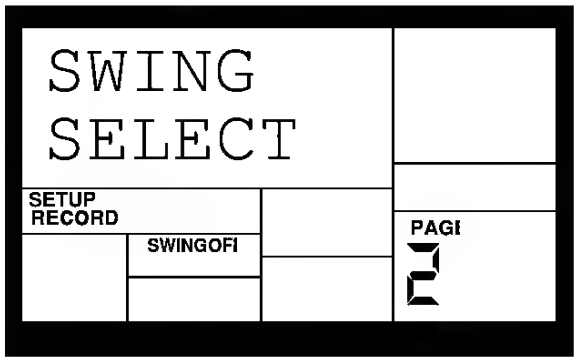
Note: The quantize value also sets the step length in Step Edit mode (section 2.9).

Background As you record a Pattern, quantization shifts all drum events to the nearest selected rhythmic value to eliminate small timing errors. *Example:* With a quantize value of 1/16, all drum events you play will be shifted to the nearest 16th note.

Quantization is most effective when used sparingly. If you're recording a drum part, quantize the kick and snare, but try recording the hi-hat in real time (or quantize the hi-hat, and record the snare in real time). Another trick is to combine both quantized and non-quantized parts. *Example:* hand claps often sound too mechanical when quantized—when humans clap hands, you end up with a bunch of different sounds happening within a few milliseconds of each other. A good way to simulate this effect (yet still have a rock-solid rhythm) is to record a quantized hand claps part, then turn off quantization and try to double the part. Sometimes what you overdub will be right on the beat, but sometimes it will be off by just enough to add that human touch.

2.2 PAGE 2: SELECT THE SWING VALUE (SWING SELECT)

The display shows **SWING SELECT**; the Swing window shows the swing value.



Enter the desired swing percentage with the INC/DEC or number buttons (1 = 54%, 2 = 58%, 3 = 62%, 4-0 = Swing Off).

Swing shifts notes as specified while you record, so choose the desired value before tapping out your rhythms.

Background Swing affects the timing of *pairs* of equal-value notes. Each note normally defaults to taking up 50% of the total duration of both notes; adding swing *lengthens* the first note of the pair, and to keep the total duration of both notes the same, *shortens* the second note of the pair. This imparts the kind of feel found in shuffles and some jazz tunes. *Example:* With Swing set to 62%, the first note of the pair takes up 62% of the total duration of the pair of notes, while the second note takes up 38% of the total duration.

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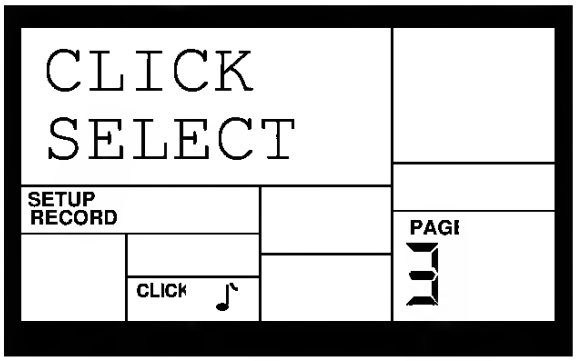
2.3 PAGE 3: ENABLE CLICK (METRONOME) AND SET RHYTHM (CLICK SELECT)

The display shows **CLICK SELECT**; the Click window shows the click's rhythmic value.

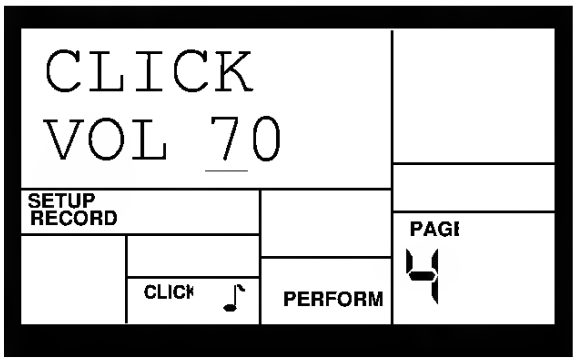


Enter the click value with the INC/DEC or number buttons (1 = quarter note, 2 = quarter note triplet, 3 = 8th note, 4 = 8th note triplet, 5 = 16th note, 6 = 16th note triplet, 7-0 = Click Off).

The click is audible only in Compose mode.

2.4 PAGE 4: SET CLICK (METRONOME) VOLUME (CLICK VOL)

The display shows **CLICK VOL** and a two-digit number representing click volume (**00** = inaudible, **99** = maximum volume). Enter the desired click level with the INC/DEC or number buttons.



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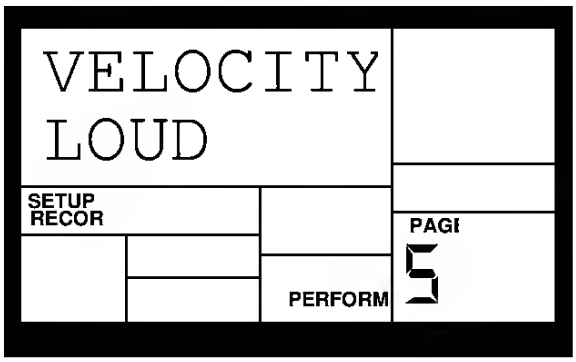
2.5 PAGE 5: ADJUST VELOCITY RESPONSE (VELOCITY)

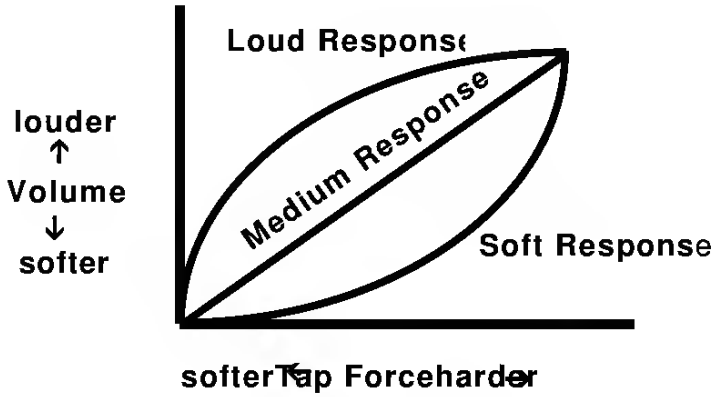
There are 11 ways in which a pad's output level can respond to the force with which you tap it: soft, medium, loud, and eight fixed responses.



The display says **VELOCITY**. To select the desired dynamic response, use the INC/DEC or number buttons (1 = Fixed 1, 2 = Fixed 2, 3 = Fixed 3, 4 = Fixed 4, 5 = Fixed 5, 6 = Fixed 6, 7 = Fixed 7, 8 = Fixed 8, 9 = Soft, and 0 = Loud). Medium can be selected only with the INC/DEC buttons.

Background This feature accommodates players with a heavier or lighter touch. Referring to the diagram, soft response weights the response toward softer sounds; with medium response, the level is directly proportional to how hard you tap the pad; loud response weights the response toward louder sounds.

Fixed volume plays back the associated drum sound at one of eight possible volume levels. With Fixed Volume 1, all drums assume the level of the softest possible tap, regardless of how hard you tap the pads. With Fixed Volume 8, all drums assume the level of the loudest possible tap, regardless of how hard you tap the pads. Fixed Volumes 2-7 provide the levels between the softest and loudest extremes, with lower numbers giving softer levels.



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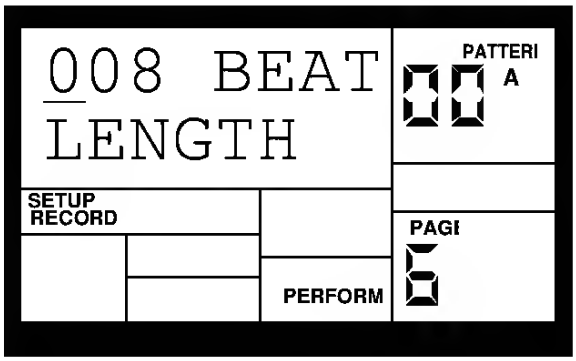
2.6 PAGE 6: ADD/REMOVE BEATS FROM PATTERN END (LENGTH)

This option either adds beats to, or subtracts beats from, the end of the Pattern. The Pattern length can be set prior to, or after, recording. Shortening a Pattern's end point erases any drum events that fall outside the remaining part of the Pattern; lengthening a Pattern's end point adds silence at the end of a Pattern. It is also important to note that changing a Pattern's length also changes the length of the associated Fill Pattern.

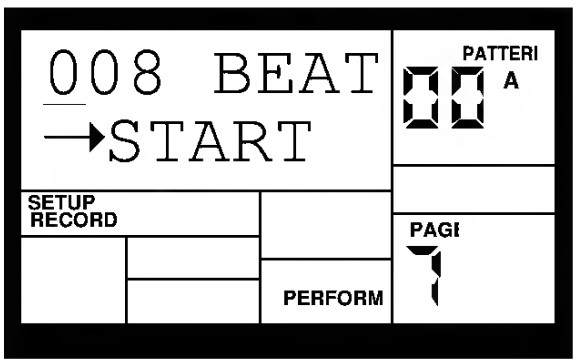


The display says **### BEAT** and **LENGTH**. This indicates a Pattern's length in beats (quarter notes). Enter the desired length with the INC/DEC or number buttons (this must be a three digit number; enter leading zeroes if necessary). To prevent accidental length alteration, you must press PLAY before the SR-16 will store the new Pattern length. The display shows **CHANGED LENGTH** for as long as PLAY is pressed.

Background Odd time signatures are not a problem since Patterns can be any number of beats (up to 128). *Example:* For a measure of 13/4 followed by a measure of 5/4, program a 13-beat Pattern and a 5-beat Pattern.

2.7 PAGE 7: ADD/REMOVE BEATS FROM PATTERN BEGINNING (→START)

This option either adds beats to, or subtracts beats from, the beginning of the Pattern. The Pattern length can be set prior to, or after, recording. Shortening a Pattern's start point erases any drum events that fall outside the remaining part of the Pattern; lengthening a Pattern's start point adds silence at the beginning of a Pattern.



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The display says **### BEAT** and **→START**. This indicates a Pattern's length in beats (quarter notes). Enter the desired length with the INC/DEC or number buttons (this must be a three digit number; enter leading zeroes if necessary). A smaller value compared to the original length will remove the difference, in beats, from the beginning of the Pattern. A larger value will add the difference, in beats, to the beginning of the Pattern.

Background An example will help clarify how beats are added to or removed from the beginning. Assume an original length of 008 beats. Changing →START to 007 will delete 1 beat from the Pattern beginning. Therefore, what had been beats 002-008 will now be beats 001-007. Because a beat was removed, the Pattern will be 7 beats long.

Changing →START to 009 will add a beat to the beginning of the Pattern. What had been beats 001-008 will now be beats 002-009. Because a beat was added to the beginning, the Pattern will be 9 beats long and the beat added at the beginning will be silent.

2.8 PAGE 8: OFFSET A PATTERN OR DRUM PART

Offset shifts a Pattern or individual drum parts ahead of or behind the beat in 1/384th note increments to allow for altering the "feel" of a piece. This only affects already-recorded parts.

1. The SR-16 should be in Pattern mode and stopped. The display says **OFFSET**, which will be **00/384** (no offset).
2. Press the pad to be offset (as confirmed by the display). If you don't select a pad, offset affects the entire Pattern.
3. Enter the two-digit offset value with the INC/DEC or number buttons. Positive numbers shift events ahead of the beat (lead), negative numbers shift events behind the beat (lag).
The default is positive numbers; to enter a negative number with the number buttons, press DEC first. *Example:* To offset a part 1/16th note later, enter -24 as the offset value since 24 sub-beats equals a 1/16th note.

Press PLAY to enter this number into the SR-16. To apply the same amount of offset to additional pads, press the next pad then press PLAY.

Notes: The display counter resets after you exit the function. Therefore, it does not keep track of the total amount of offset, but only changes in offset.

Drums offset to before the first beat "wrap around" to the end of the Pattern; drums offset past the end of the last beat "wrap around" to the beginning of the Pattern.

2.9 PAGE 9: STEP MODE RECORDING (STEP MODE)

The display shows **STEP MODE?** This is your "gateway" to step editing, which provides detailed Pattern editing and recording. To enter the step editor, press PLAY.

The display now shows the beat and sub-beat. If a drum event exists on this beat/sub-beat, the display will also show the drum pad that played the event and the event volume. If more

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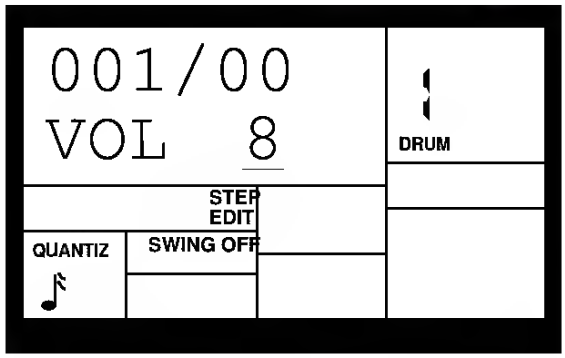
than one drum event occurs on the same sub-beat, the PAGE UP/DOWN buttons step forward or backward respectively through each drum one at a time.



If no drum event exists on this beat/sub-beat, the display will show no pad number, and **EMPTY** in place of volume data.

To navigate through the steps at the current quantization rate, use the PAGE UP button to move forward or PAGE DOWN to move backward. If a drum exists between those beats that fall on the current quantization value, the drum will sound as you go past it, but the display will not stop on that drum.

If swing is on, step mode will step in "swinged" increments (see section 2.2).

Background Step mode provides detailed Pattern editing. (Note that "step" does not refer to Song steps, but to the steps in a Pattern that hold drum events.) You can move through a Pattern one step at a time, stop at each event as desired, and delete the event, add an event, or change an event's volume. While occasionally somewhat tedious, Step Edit mode allows editing drum parts to your exact specifications.

Each step (also called a sub-beat) is 1/96th of a beat in duration, so at maximum resolution it takes 96 steps to "move through" a quarter note. To save time, you can step through the Pattern at various note values, as set by the quantization value (which is why it's preferable to select the quantization rate at which the Pattern was recorded). *Example:* A 16th note consists of 24 sub-beats, so setting the quantization value to 1/16 lets you step through the Pattern 24 sub-beats at a time. The following chart relates the number of sub-beats to note/quantization values.

NOTE VALUE		NOTE NAME		SUB-BEATS
1/4	=	QUARTER NOTE	=	96
1/6	=	QUARTER NOTE TRIPLET	=	64
1/8	=	EIGHTH NOTE	=	48
1/12	=	EIGHTH NOTE TRIPLET	=	32
1/16	=	16th NOTE	=	24
1/24	=	16th NOTE TRIPLET	=	16
1/32	=	32nd NOTE	=	12
1/48	=	32nd NOTE TRIPLET	=	8

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The following page summarizes the step edit options.

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2.9A Add a New Drum to a Step

Use the PAGE buttons to select the step where the drum is to be added. Press the pad that corresponds to the sound you want to add. That drum, along with its volume (how hard the pad was hit), will be recorded into the displayed step.

If you play a pad and there is already a drum event played by that pad on the displayed step, you will edit the volume rather than add another event. This is true even if there are several events on the displayed beat, and an event other than the one to be edited is showing.

2.9B Erase a Drum Sound From a Step

Use the PAGE buttons to locate the step containing the drum to be erased. While holding down the ERASE button, press PLAY. The drum that was being displayed will be erased.

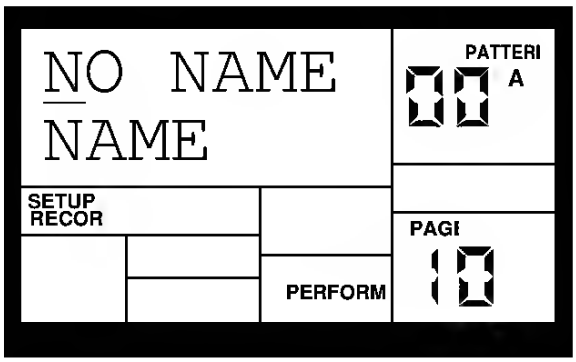
2.9C Change a Drum Sound's Volume in a Given Step

Use the PAGE buttons to select the step containing the drum whose volume needs to be changed. Either press a number button from 1-8 (1=softest, 8=loudest), use the INC/DEC buttons, or tap the displayed drum pad at the desired level. If you play a pad to change the level and there are several events on the same step, the display need not show the specific drum whose volume you want to edit.

2.9D Exit Step Mode

To exit step mode, press STOP, RECORD SETUP, or PLAY (the latter will begin playing the Pattern from the beginning).

2.10 PAGE 10: NAME THE PATTERN (NAME)



The display shows **NAME** and the current name (or **NO NAME** if the Pattern has not yet been named). To name, use the PAGE UP/DOWN buttons to select the character to be changed; select the desired character with the INC/DEC buttons. Lower case and upper case letters, numbers, punctuation, and various special-purpose characters are available. You can also enter numbers with the number buttons.

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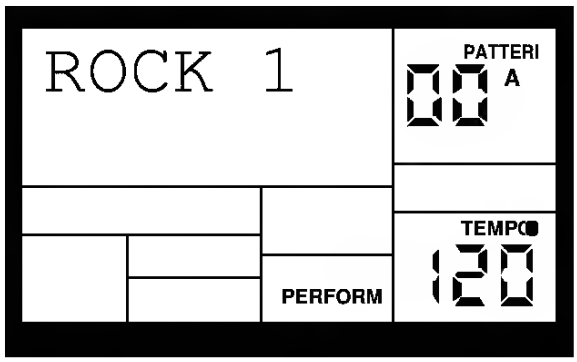
CHAPTER 3: PLAYING BACK/RECORDING PATTERNS

3.1 PLAYBACK/RECORD BASICS

Please make sure you've read section 1.2B, which explains the different types of SR-16 Patterns. It is important to understand the differences between these Pattern types.

The PATTERN/SONG button chooses between Pattern and Song modes. For all of the following Pattern operations, Pattern mode must be selected, as confirmed by the display.



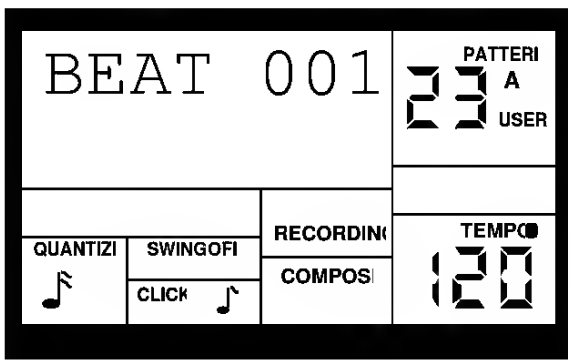
3.1A The Dual-Purpose Fill Button

In addition to calling up Fill Patterns as described in the Introduction, the FILL button can also be used while recording to create a series of notes at the desired quantization rate, as described in section 3.1K.

3.1B Perform/Compose Modes

The SR-16 doesn't have a record button. Instead, press PLAY to start the Pattern, then select either *Perform* or *Compose* mode (as selected by the PERFORM/COMPOSE button).

To record, choose Compose mode (as shown in the display). This also activates the click.



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To listen, choose Perform (this de-activates the click). You can drop in and out of these two modes as you record. While the SR-16 is in either mode, you can change Pattern quantization, swing, click rhythm and volume, pad velocity response, name, drumset, drumset parameters, and MIDI parameters. You can therefore keep the groove going at all times, even while you make adjustments prior to recording another part.

NOTE: Compose mode cannot be selected when using Preset Patterns, since they cannot be altered. If you wish to alter one of the Preset Patterns, copy it to an empty User Pattern first. (see section 3.3A)

3.1C Set Pattern Tempo

The tempo range extends from 20 to 255 beats per minute. Tempo can be changed while the SR-16 is stopped or running. There are two ways to set tempo.

• Before initiating Pattern play, tap the STOP button several times at the desired tempo. The SR-16 will average the time between taps and derive a tempo; the display will update the tempo with each tap. If a footswitch is plugged into the Count/A/B/Fill jack, tapping the footswitch at the desired rate is equivalent to tapping the STOP button. These techniques work only if the SR-16 is stopped.
• Use the TEMPO/PAGE up and down buttons. Press once to increment/decrement 1 BPM at a time, or press and hold to scroll through the tempo values.

Background While in Pattern mode, the tempo remains as is until changed because the tempo is a global setting—it is not stored with individual Patterns. If you switch over to Song mode (Chapter 5) and the programmed Song tempo is different, the SR-16 will assume the Song's tempo—even if you switch back into Pattern mode—until the tempo is changed again (either manually, or by selecting a different Song).

3.1D Select Individual Patterns

1. Make sure the SR-16 is in Pattern mode.
2. Enter a two-digit Pattern number (remember to enter a leading 0 if necessary).
3. Press the A button to select the A Main Pattern, or B to select the B Main Pattern. To select a Fill Pattern, first select the desired Main Pattern (A or B) then press the Fill Button.
4. Press PRESET/USER to select either a Preset or User Pattern.

When a Main Pattern reaches its end, it will loop back to the beginning and continue playing from that point unless you select a new Pattern, selected a Fill Pattern initially, or stop the Pattern (section 3.1E).

If you select a User Pattern that contains no data, the display says **EMPTY PATTERN**. If you select a User Pattern that contains data but has not yet been named, the display says **NO NAME**.

3.1E Stop/Restart a Pattern

1. To stop the Pattern, press STOP.
2. To restart the Pattern from the beginning, press PLAY. Pressing PLAY will always restart a Pattern from the beginning, regardless of whether the Pattern is stopped or already playing.

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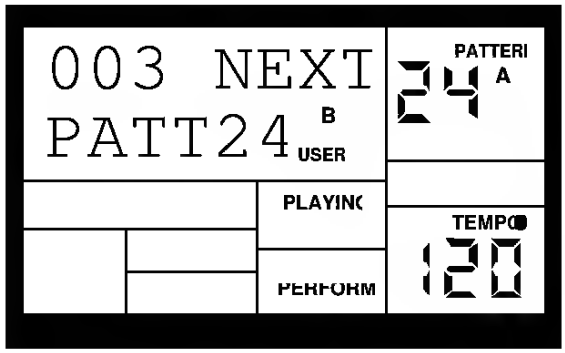
3.1F Using the Start/Stop Footswitch

When the SR-16 is stopped, pressing a footswitch plugged into the Start/Stop footswitch jack is equivalent to pressing PLAY. When the SR-16 is running, pressing the footswitch is equivalent to pressing STOP.

Background The rear panel Start/Stop footswitch jack accepts a momentary, normally open or normally closed footswitch (available at most music stores) for remote or foot control of the stop and start functions. The SR-16 checks the footswitch on power-up to determine whether it is normally open or normally closed, so make sure the footswitch is plugged in (and you're not pressing it down) when you turn on power.

3.1G Select New Patterns While in Perform (Playback) Mode

In Perform mode, you can select a new Pattern number (with the desired A or B designator) or switch from A to B Patterns within a Pattern number at any time. The newly-selected Pattern will play back as soon as the current Pattern plays through its entire length. The display shows the Pattern to be played next.



To select a new Pattern in Perform mode, enter the two-digit Pattern number. If an A Pattern is currently playing, the new Pattern number will play the A variation. If a B Pattern is currently playing, the new Pattern number will play the B variation.

You can also enter a two-digit Pattern number followed by A or B or PRESET/USER to call up an A or B or Preset or User Pattern, regardless of the Pattern that is currently playing. Fills are a special case that will be discussed next.

Notes

- If you change your mind or select the wrong Pattern, you can select a new Pattern number at any time before the next Pattern begins.
- If you press STOP before the next Pattern begins playing, the SR-16 will stop and remain on the currently selected Pattern.
- Shortcut: To choose the next higher-numbered Pattern than the one in the display, press the INC button (if 49 is the current Pattern, pressing INC calls up Pattern 00). To choose the next lower-numbered Pattern than the one in the display, press the DEC button (if 00 is the current Pattern, pressing DEC calls up Pattern 49).
- If you select a new Pattern and press PLAY, it will immediately start playing the next Pattern.

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3.1H Select Fill Patterns in Perform (Playback) Mode

Fill Patterns are the key to creating expressive drum parts. However, Fill is a sophisticated feature that requires some explanation.

Remember that Fills are always the same length, and use the same Drum Set, as the associated Main Pattern. This lets you "drop in" a Fill at any time. As soon as you press the FILL button, the Fill takes over from the Main Pattern and starts playing until the end of the Fill.

Generally, Fills are transitional Patterns. *Example:* Suppose an 8-beat A Main Pattern is playing and you press the FILL button on beat 4. The A Fill Pattern will play the last 4 beats and then automatically transition into the B Main Pattern. Conversely, if B Main is playing and you press Fill, after B Fill has played, the SR-16 will transition to the A Main Pattern. You can select the Fill at any time the Main Pattern is playing.

However, Fills do not *have* to be transitional Patterns. If you press the FILL button (or footswitch) before the Fill has finished playing and hold it down until after the Fill has played *(i.*e., past the downbeat of the next Pattern), the SR-16 will return to the original Main Pattern. *Example:* Suppose an 8-beat A Main Pattern is playing and you press the FILL button on beat 4 but hold it down past beat 8. The A Fill Pattern will play the last 4 beats, then the SR-16 will return to the A Main Pattern.

Fills cannot start on the downbeat since a Fill, by definition, starts at some point into the Main Pattern. However, anything you record on the Fill downbeat will play on the first downbeat following the Fill *(i.*e., the downbeat of the next Pattern). To show why this is a useful feature, consider that when coming out of a fill, you'll often want to hit something like a cymbal crash on the downbeat of the next Pattern yet not have that crash repeat every time the Pattern plays. This way of handling Fills lets the downbeat cymbal crash be part of the Fill instead of the Pattern.

A footswitch plugged into the Count/A/B/Fill jack duplicates the FILL button function when playing Patterns in Perform mode.

Background This way of handling Patterns explains the logic behind having A, B, and Fill Patterns. In typical pop tunes, A would be the verse and B the chorus. A Fill provides the Fill that transitions from verse to chorus, and B Fill provides the Fill that transitions from chorus to verse. Thus, one of the numbered Patterns may be all you need to put together a tune.

This structure makes it possible to put together songs in minutes using the Preset Patterns. It also makes it easy to play drum parts live. For example, if there's a solo happening over the A Main Pattern, you can keep the Pattern repeating until the solo is about to end, at which point you select the Fill that leads out of the A Main Pattern.

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3.1I Record a Pattern

An empty Pattern defaults to an 8 beat length, with 16th note quantization and swing off (50%). If you need to change the length, it's best (though not essential) to do so before recording. Other parameters can be changed while you're recording.

To record, select the desired User Pattern. Select Compose mode and press PLAY. Remember that you can switch between Compose and Perform while recording.

As you record, the display will show the current beat number and the tempo indicator will flash at the current tempo. You will hear any drum sounds already recorded in the currently selected Pattern.

To record drum parts into the Pattern, tap the drum pads, or send MIDI data to the SR-16 (sections 6.1 and 6.2) that triggers corresponding drum notes. The Pattern will "loop" during the record process so that you can overdub different drums on different passes.

To exit Record mode, press STOP. Pressing PLAY while in Compose mode will re-start the Pattern from the beginning; the SR-16 remains in record mode.

Note: When sending MIDI data into the drums when the SR-16 is not recording *(i.*e., the SR-16 serves as a drum sound expander module), the drum sounds respond to 127 different levels of dynamics. However, if MIDI is used as a trigger during the recording process, the Pattern will "quantize" the incoming level to the nearest of eight levels—the same eight levels produced by tapping the pads at various levels.

3.1J Select New Patterns and Fills While in Compose (Record) Mode

In Compose mode, Main Pattern selection works in the same manner as Perform mode—select a Pattern number (with the desired A or B designator), and the newly-selected Pattern will play back as soon as the current Pattern plays through its entire length. The display will show the Pattern to be played next.

In Perform mode, Fills are transitional Patterns. If you press FILL in Compose mode, a Fill will continue playing—not transition to a different Pattern when it's finished playing—so you can record into it, like a standard Pattern. Remember, as mentioned earlier, that the Fill also plays the downbeat of the next Pattern.

If a footswitch is plugged into the Count/A/B/Fill jack when recording Patterns in Compose mode, pressing the footswitch will switch a Main Pattern over to its associated Fill. The Fill will continue playing until you press the footswitch again, at which point the SR-16 will revert to the associated Main Pattern.

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3.1K Using Fill to Create Repetitive Drum Hits

As mentioned earlier, the FILL button performs two different functions. We've already covered how to use the FILL button for Pattern selection, however, it can also trigger a drum sound at the current quantization rate *(e.g.,* eighth notes, 16th notes, etc.; if quantization is off, though, this function is inactive) and swing value. This allows playing a series of drum hits without having to repeatedly press the pads, and is typically used to create steady 16th note hi-hat parts, quarter note kick drum parts, snare rolls, etc.

1. The SR-16 should be in Compose mode and recording.
2. Press a pad on the first beat of what will be a series of hits and hold it down.
3. Immediately after pressing the pad, press and hold the FILL button. The drum will be re-triggered at the current quantization rate for as long as the pad and FILL buttons are held down. All hits will be at the same volume as the first pad hit.

Caution: If you don't hit the drum first, pressing the FILL button will select a Fill Pattern.

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3.2 ERASE FUNCTIONS

3.2A Erase Mistakes While Recording

While the SR-16 is recording, you can erase any individual drum event or series of events in real time to fix up errors. Erasure occurs only on those beats that coincide with the current quantization and swing values; turn quantization *off* to erase a drum wherever it occurs.

1. The SR-16 should be in Compose mode and recording.
2. Press and hold ERASE.
3. While holding down ERASE, press the pad corresponding to the sound to be erased just before the first event to be erased, and release just after the last event to be erased. To erase a single event, tap the pad on that single event.

3.2B Erase an Entire Pattern

If you erase *both* Main and Fill Patterns associated with a numbered Pattern, or you erase a Main or Fill Pattern and the other is empty, the Drum Set assignment (but not its Drum Set parameters), name, and length will revert to the default settings *(i.e.,* the Drum Set with the same number as the Pattern, **EMPTY PATTERN** as the name, and a length of 8 beats). However, as long as either a Main or Fill Pattern contains previously-programmed data, the numbered Pattern will remember the Drum Set assignment, name, and length.

1. The SR-16 must be in Pattern mode and stopped to allow erasing a Pattern.
2. Enter the two-digit Pattern number to be erased with the number or INC/DEC buttons.
3. Press and hold the ERASE button. The display says **PATTERN ERASE?**
4. While continuing to hold the ERASE button, press PLAY. The display says **PATTERN ERASED**, followed by **FILL ERASE?** .
5. While continuing to hold the ERASE button, press PLAY again. The display will read **FILL ERASED.**
6. Release both buttons.

Note: To retain the Drum Set assignment, length, and name when you erase a Pattern, hold ERASE and tap each drum pad. This erases the drum events, but retains all other Pattern parameters.

3.2C Erase All Events Played by a Particular Drum Pad

This erases all events in a Pattern played by a specific pad. The Drum Set's parameters are not altered.

1. The SR-16 should be in Pattern mode and stopped, in either Perform or Compose mode. To erase while recording, see section 3.2A.
2. Press and hold ERASE.
3. While holding down ERASE, tap a pad to erase all events played by that pad. The display shows the drum pad number whose events were erased. You can continue to erase more drum sounds while ERASE is held down.

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3.3 COPY FUNCTIONS

The following Copy functions assume that you are copying a Main Pattern to a Main Pattern (remember, copying a Main Pattern to another Main Pattern copies the Fill along with it). Other combinations take the following rules into account.

• Copying a Main Pattern to a non-empty Pattern or to itself appends the Fill to the existing Fill, as well as appends the Main Pattern to the existing Main Pattern.
• If you copy from Main to Fill (or vice-versa) within a particular numbered Pattern, the destination will be erased and replaced with the source Pattern since Main and Fill Patterns must have the same length. This is useful if you want the Fill to contain variations on the Main Pattern—just copy the Main to Fill and make your additions/changes.
• Copying a Fill to a Fill follows the same rules as copying a Main Pattern to a Fill.
• The only copy technique that appends a Pattern to another Pattern is copying a Main Pattern to another Main Pattern.

3.3A Copy, Append, and Double Patterns

1. The SR-16 should be in Pattern mode and stopped.
2. Select the Pattern to be copied.
3. Press and hold the COPY button, and keep holding it down until step (6). The display says **COPY TO PATT**.
4. Enter the destination Pattern number into which the current Pattern will be copied with the INC/DEC or number buttons.

• Copying a Pattern to a blank destination Pattern replaces the blank Pattern with the original Pattern data.
• Copying to a Pattern that already contains data appends the original data to the end of the data in the destination Pattern. If this would result in a Pattern with more than 128 beats, the display will say **TOO MANY BEATS**.
• Copying a Pattern to itself doubles the length.
• The Drum Set assignment and Pattern name are copied along with the drum data only if the destination Pattern is empty.

5. Press PLAY. The display says **COPY DONE**.
6. Release the COPY and PLAY buttons.

3.3B Copy One Drum Pad's Part to Another Drum Pad

Merge: When the destination drum pad **already has a pattern**, the source pattern will be merged with the destination pattern. Note that if the two parts contain events for the same pad on the same beat, only one event will prevail and it will take the level of the source Pattern event.

Sound Stacking™: When the destination drum pad is **empty** (no recorded pattern), the source pattern will be copied and any drum sound assigned to the destination drum pad will play the exact same pattern as the source drum pad. This technique lets you stack multiple drum sounds together to create monster composite sounds. See section 8.3: Sound Stacking.

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1. The SR-16 should be in Pattern mode and stopped.
2. Select the Pattern containing the drum part to be copied.
3. Press and hold the COPY button, and keep holding it down until step (7). The display says **COPY TO PATT**.
4. Tap the pad to be copied. The display shows the pad number *(e.g.,* **D8** if you hit pad 8).
5. Tap the destination pad that should hold the copied part. As long as COPY is held down, the destination pad can still be changed by selecting another drum pad.
6. Press PLAY. The display says **COPY DONE**.
7. Release the COPY and PLAY buttons.

3.3C Copy a Single Drum Pad's Part to a Drum Pad in a Different Pattern

This copy function *merges* the source drum pad rhythm with the destination drum pad rhythm in a different Pattern. To *replace* the destination rhythm with the source rhythm, first erase the destination pad rhythm to be replaced (section 3.2C).

1. The SR-16 should be in Pattern mode and stopped.
2. Select the Pattern containing the drum part to be copied.
3. Press and hold the COPY button, and keep holding it down until step (8). The display says **COPY TO PATT**.
4. Enter the destination Pattern number to which the drum part should be copied.
5. Tap the pad containing the part to be copied. The display will show the drum number (such as **D2** if you hit pad 2).
6. Tap the destination pad to which the source part will be merged. Often when copying to a different Pattern, this will be the same drum pad number as selected in step (5). As long as COPY is held down, the destination pad can still be changed by selecting another drum pad.
7. Press PLAY. The display says **COPY DONE**.
8. Release the COPY and PLAY buttons.

3.3D Copy a Pattern to Another SR-16 Via MIDI

The SR-16 can send User Pattern system exclusive information (for the Main and Fill Patterns) to another SR-16 via MIDI. If you have only one SR-16, you can skip this section.

1. The source SR-16 should be in User Pattern mode and stopped. Connect the source SR-16 MIDI out to the destination SR-16 MIDI in.
2. Select the Pattern to be copied.
3. Press and hold the COPY button, and keep holding it down until step (5). The display says **COPY TO PATT**.
4. Do not enter any destination Pattern number—just press PLAY to send the data out over MIDI. The display says **PATT OUT MIDI**. The source SR-16's Pattern will end up in the receiving SR-16's currently selected Pattern location.

- This procedure follows the standard copy rules described at the beginning of section 3.3.
- If the receiver was set to Main, and the Pattern is not empty, the source Main and Fill Patterns will be appended to the receiver's Main and Fill Patterns.
- If the receiver was set to Fill, the Fill will replaced by that of the source Pattern to maintain the same Main and Fill Pattern lengths.

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5. Release the COPY and PLAY buttons.

3.3E Copy a Single Drum Pad's Part to a Drum Pad in Another SR-16 Via MIDI

The SR-16 can send system exclusive information for a drum part to another SR-16 via MIDI. If you have only one SR-16, you can skip this section.

This copy function *merge*s the source drum pad rhythm with the destination drum pad rhythm in another SR-16. To *replace* the destination rhythm with the source rhythm, first erase the destination pad rhythm to be replaced (section 3.2C).

1. The source SR-16 should be in Pattern mode and stopped. Connect the source SR-16 MIDI out to the destination SR-16 MIDI in.
2. Select the Pattern containing the drum part to be copied.
3. Press and hold the COPY button, and keep holding it down until step (7).The display says **COPY TO PATT**.
4. Tap the pad containing the part to be copied. The display will show the drum number (for example, **D2** if you hit pad 2).
5. Tap the destination pad on the destination SR-16 to which the source part will be merged. Often when copying to a different Pattern, this will be the same drum pad number as selected in step (4). As long as COPY is held down, the destination pad can still be changed by selecting another drum pad.
6. Press PLAY. The display says **DRUM OUT MIDI**.
7. Release the COPY and PLAY buttons.

3.3F Copy a Drum Set to Another SR-16 Via MIDI

The SR-16 can send Drum Set system exclusive information to another SR-16 via MIDI. If you have only one SR-16, you can skip this section.

1. The source SR-16 should be in Pattern mode and stopped. Connect the source SR-16 MIDI out to the destination SR-16 MIDI in.
2. Select the Drum Set to be copied.
3. Press and hold the COPY button, and keep holding it down until step (5).
4. Press DRUM SET to send the data out over MIDI (the display says **SET OUT MIDI**).
5. Release the COPY and PLAY buttons.

The current Drum Set parameters, including changes you may have made, will reside in the destination SR-16's Drum Set memory buffer. To save the Drum Set, you must save it to a *user* Drum Set memory location in the destination SR-16. Its display will show **DRUMSET EDITED** to remind you that the Drum Set needs to be saved.

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CHAPTER 4: CREATING DRUM SETS

The SR-16's 12 pads can be assigned to various drum sounds, with different levels, tuning, panning, triggering mode, and output jack assignment. Each set of pad parameters is given a number and collectively are called a Drum Set; each A and B user Pattern can have its own Drum Set assignment. There are 50 preset Drum Sets and 50 user-programmable Drum Sets. Drum Set assignments have their own dedicated memory and can be thought of as equivalent to the "programs" or "patches" found in synthesizers.

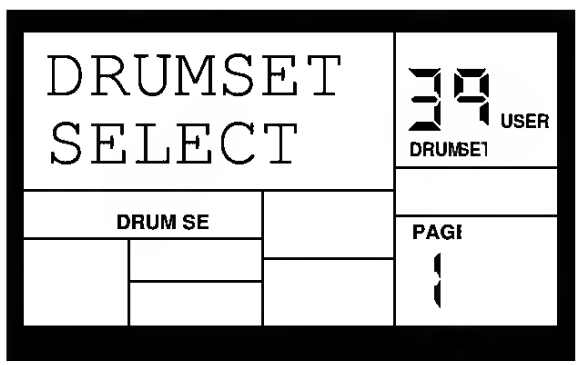
Note that if you edit a Drum Set, any Pattern using that Drum Set will be affected. Most SR-16 aficionados keep a one-to-one correspondance between Drum Sets and Patterns by assigning Set 00 to Pattern 00, Set 01 to Pattern 01, Set 02 to Pattern 02, etc.

General instructions for Drum Set construction are:

1. Press the DRUM SET button.
2. Use the Page (up and down) buttons to select different "pages" of functions; the display's lower right window shows the page number. These pages are described below.
3. Adjust values on pages, if necessary, as described for each page.
4. After making all needed changes, save the Drum Set if desired (Page 8), then press DRUM SET again to exit (or choose another page).

4.1 PAGE 1: SELECT DRUM SET (DRUMSET SELECT)

The display shows **DRUMSET SELECT**, the currently selected Drum Set number, and whether the Preset or User Drum Set bank is currently selected.



1. Press the PRESET/USER button to choose the desired bank of Drum Sets.
2. Enter the desired Drum Set number (from 00 to 49) with the number or INC/DEC buttons. With the number buttons, enter a leading zero if necessary.
3. User Patterns will remember the selected Drum Set assignments (Preset Patterns have fixed Drum Set assignments; if you exit from the Preset Pattern, the SR-16 will forget any assignment you made).

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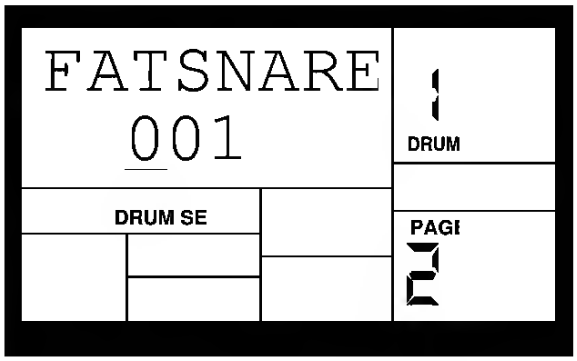
4.2 PAGE 2: ASSIGN SOUNDS TO PADS

The display shows the currently selected pad number and the sound assigned to that pad.



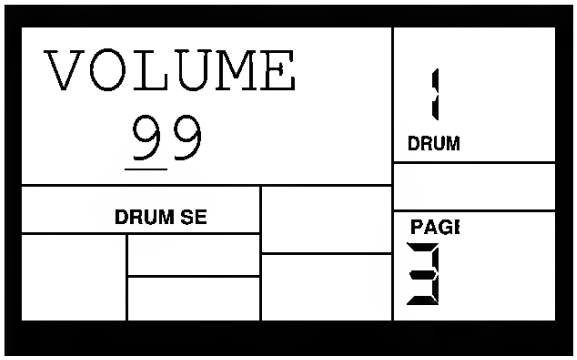
You can assign any of the SR-16's sounds to any of the pads, or to more than one pad. Each individual Drum Set can have its own drum sound assignment.

To assign a sound to a pad:

1. Press the pad (the display will show the pad number).
2. Enter the desired drum sound number with the number or INC/DEC buttons. When using the number buttons, enter a leading zero if necessary. The chart included with the SR-16 describes each of the over 230 drum sounds.
3. When the display confirms your choice, either store the edited Drum Set (see section 4.8) or do more assignments by tapping another pad to select it, and assigning a drum sound to it.

4.3 PAGE 3: SET PAD VOLUME (VOLUME)

The display shows **VOLUME**, the currently selected pad number, and the volume of the sound assigned to that pad.



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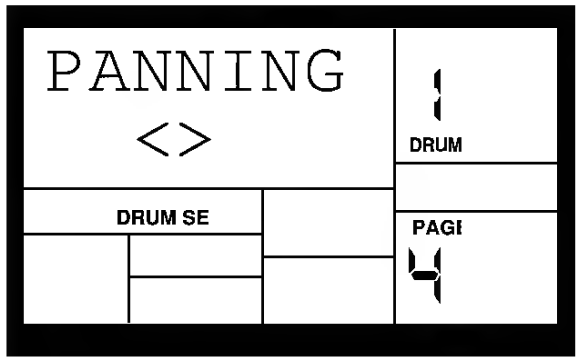
To change the volume associated with a given pad:

1. Press the pad (the display will show the pad number).
2. Enter the desired volume, from 00 (full off) to 99 (maximum volume), with the number or INC/DEC buttons.
3. When the display confirms your choice, either store the edits you've made (see section 4.8) or do more assignments by tapping another pad to select it, then assigning the pad volume.

4.4 PAGE 4: SET PAD STEREO POSITION (PANNING)

The display shows **PANNING**, the currently selected pad number, and the pan position assigned to that pad. (Note the cute little arrows indicating pan position; they move when you pan the drum sound.)



To change the pan position associated with a given pad:

1. Press the pad (the display will show the pad number).
2. Enter the desired pan position, from full left to full right, using either the number or INC/DEC buttons. The seven available pan positions correspond to the number buttons shown in parenthesis: hard left (1), soft left (2), left of center (3), center (4), right of center (5), soft right (6), and hard right (7).
3. When the display confirms your choice, either store the edited Drum Set (see section 4.8) or do more assignments by tapping another pad to select it, then assigning the pan position.

Background The SR-16 has two pairs of stereo outputs. Drum sounds can be assigned to either pair of outputs (Page 7), and be placed anywhere within the stereo field of the assigned outputs via the pan function.

When heard from the drummer's perspective, the high-hat will usually be on the left, snare and kick in the center, and toms trailing from left-center to right. Of course, one of the advantages of electronic drum sets is that you need not follow any standard way of placing drum sounds in the stereo field.

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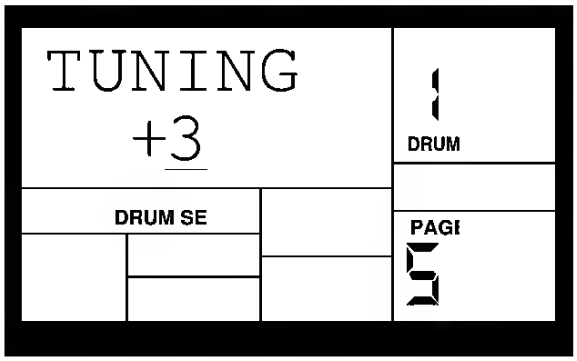
4.5 PAGE 5: SET PAD TUNING (TUNING)

The display shows **TUNING**, the currently selected pad number, and the tuning assigned to that pad.

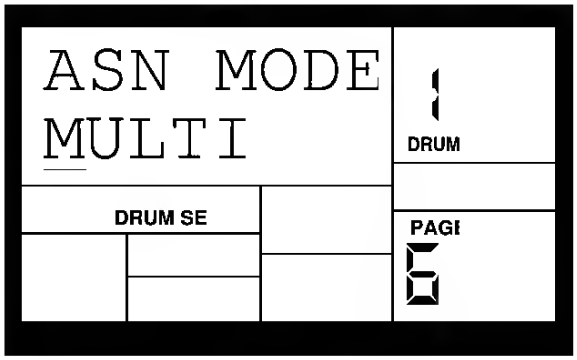


To change the tuning associated with a given pad:

1. Press the pad (the display will show the pad number).
2. Enter the desired tuning with the INC/DEC buttons. The range is from +3 (most sharp) to 0 (normal pitch) to -4 (most flat).
3. When the display confirms your choice, either store the edits (see section 4.8) or do more assignments by tapping another pad to select it, then assigning the new tuning.

4.6 PAGE 6: SET TRIGGERING MODE (ASN MODE)

The display shows **ASN MODE** (short for Assignment Mode), the currently selected pad number, and the mode assigned to that pad.



To change the mode associated with a given pad:

1. Press the pad (the display will show the pad number).
2. Enter the desired mode with the INC/DEC buttons or number buttons 1-4.
3. When the display confirms your choice, either store the edited Drum Set (see section 4.8) or do more assignments by tapping another pad to select it, then changing the new assignment mode.

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Background Each mode affects triggering in a different way:

Multi: When hitting a pad repeatedly, each hit will cause the sound to go through its entire decay. This is useful with cymbals, since early strikes will continue to decay as you play later strikes.

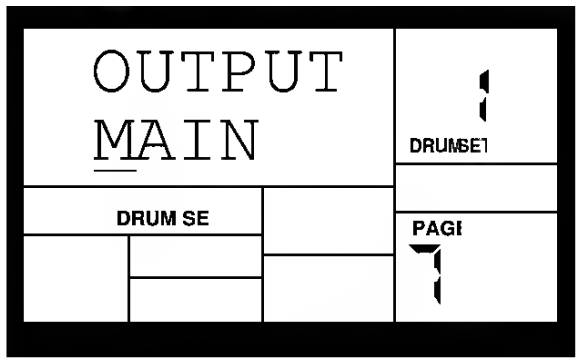
Single: When hitting a pad repeatedly, a new hit will automatically terminate any sound that is still decaying. This is useful with many percussion sounds (such as tambourine, agogo, etc.).

Group 1 and 2: Pads assigned to a particular group (1 or 2) will cut each other off if a group pad is struck while another pad assigned to the same group continues to sound. The classic use of this is with hi-hats; a closed high-hat will cut off an open hi-hat, and hitting an open hi-hat sound will cut off a closed hi-hat.

The SR-16 can play up to 16 voices at a time, so it's possible to run out of voices if you play a flurry of notes and have lots of pads in the Multi assign mode. If 16 sounds are playing and you ask the SR-16 to play another one, the sound that's closest to finishing its decay cycle will be "stolen" so that the most recent sound can be played. In practice, it's difficult (and usually not artistically desirable!) to create drum parts so complex that voice-stealing becomes a problem. However, if this is a problem, try assigning all the toms to a group so that they only require one voice at a time.

4.7 PAGE 7: CHOOSE OUTPUT JACKS (OUTPUT)

The display shows **OUTPUT**, the currently selected pad number, and the pad's output assignment.



To change the output assignment:

1. Press the pad (the display will show the pad number).
2. Use the INC/DEC buttons or number buttons (1 chooses the Main output pair, 2-0 the Aux output pair).
3. When the display confirms your choice, either store the changes you've made (see section 4.8) or do more assignments by tapping another pad then entering its new output assignment.

Background The SR-16 includes *two* independent stereo output pairs (Main and Aux). You can direct any pad to either output pair, and pan the sound within the selected output's stereo field (section 4.4). This allows several output assignment options:

Mono: Plug into one of the output pair jacks; the SR-16 is smart enough to know that plugging in one plug means you must want mono. Any pan settings are ignored. Do not plug into both outputs, or stereo will be activated.

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Stereo with Fixed Placement: Plug the left Main output into the left channel of your amp (or mixer), and the right Main output into the right channel. The default voice mix for the preset Drum Sets pans the drums between the Main output jacks in a way that works well for most applications.

Stereo with Variable Placement: Plug the left Main output into the left channel of your amp (or mixer), and the right Main output into the right channel. With the User Drum Sets, you can pan the drums between the Main output jacks as desired.

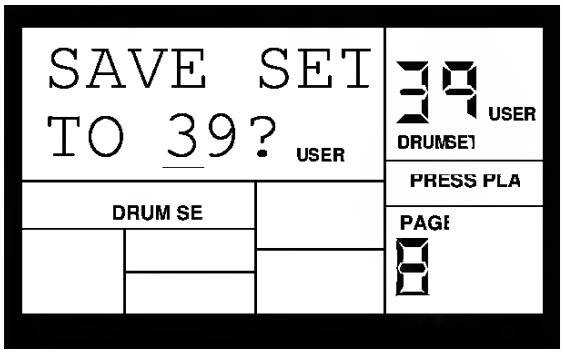
Stereo with Individual Outputs: This requires a stereo mixer with at least four channels, and provides individual outputs for any two drum voices. Plug the left Main out into a mixer channel panned fully to the left. Plug the right Main out into a mixer channel panned fully to the right. Plug the left Aux output into a third channel (panned to center for now) and the right Aux output into a fourth channel (also panned to center for now). Decide which two voices should be individual voices, such as kick and snare; assign these to the Aux outputs, and all other drums (panned as desired) to the Main outputs.

Pan the kick full left and the snare full right. Thus, the kick will appear in the left aux output, and the snare will appear in the right aux output. These outputs can feed different signal processors and then sent to a mixing board. Make sure that the drums selected for individual outputs are panned to the extreme left or right in the SR-16. Otherwise, some of the sound from one drum will leak into the other output.

Separate Percussion/Drum Outputs: Standard drum kit sounds can be spread in stereo and assigned to the main outputs, with percussion sounds spread in stereo and assigned to the Aux outputs. Run the outputs to a mixing console, and you can treat the drum kit and percussion sounds as two submixes. This technique might also be useful if you're recording the part on tape; feed the drums to two tape tracks, and the percussion to two other tracks. Adjust the balance between the two in the mix, or fade the percussion in and out independently of the trap drum sounds. Or, process the two groups individually.

4.8 PAGE 8: SAVE DRUM SET (SAVE SET)

The display shows **SAVE SET?**, the currently selected Drum Set number (location), and a two-digit number that's the same as the currently selected Drum Set.



To save the Drum Set to the existing location, press PLAY. The display will say **DRUMSET SAVED** for as long as PLAY is held down.

To save the Drum Set to a different location, enter the new Drum Set number with the INC/DEC or number buttons (allowable range is 00-49), then press PLAY. The display will say **DRUMSET SAVED** for as long as PLAY is held down.

If you were editing a Preset Drum Set and want to save it, you will be given the option to save it to a User Drum Set since you cannot overwrite a Preset Drum Set. This technique can also

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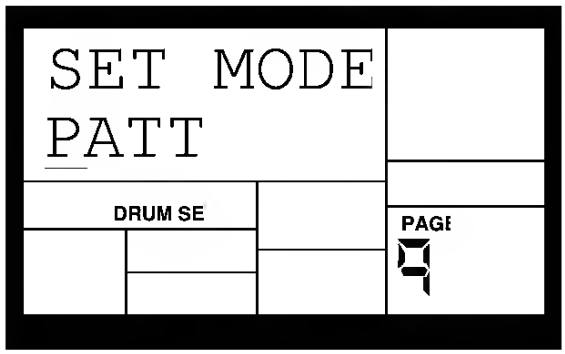
copy one Drum Set to a different Drum Set. Also, remember that if you change Patterns before saving your Drum Set, all of your edits will be lost.

4.9 PAGE 9: MANUAL DRUM SET OVERRIDE (SET MODE)

The display says **SET MODE**. Use the INC/DEC buttons to select **PATT** (each Pattern uses its assigned Drum Set) or **MANUAL** (the SR-16 will retain the currently selected drum assignments regardless of which Pattern is chosen).



Note: If changing Patterns doesn't call up different Drum Sets, this parameter is probably set to MANUAL instead of PATT.

Background Each Pattern has an associated, assigned Drum Set. However, you can tell the SR-16 to ignore these stored assignments, and retain the currently selected Drum Set regardless of whether or not you change Patterns. This is useful if you want to hear how a Pattern would sound with a different Drum Set (just set one up manually) as opposed to the one stored with the Pattern.

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CHAPTER 5: SONG MODE

5.1 SONG MODE BASICS

After creating the Patterns that make up a Song, it's time to string those Patterns together in a musically useful way. You can incorporate Preset Patterns, or a combination of Preset and User Patterns. There are three ways to create Songs:

- In real time. As the SR-16 plays in Song Mode (with Compose mode selected), it will remember the Patterns and Fills you select.
- Manually. Select Song mode and program a list of Patterns and Fills in the order in which the Patterns are to be played. You can specify the beat and sub-beat on which the Fill takes over from the associated main Pattern.
- A combination of real time and manual recording. Create a Song in real time, then edit it manually to insert extra Song steps, delete Song steps, etc.

The SR-16 holds up to 100 Songs, and each Song can contain up to 254 steps. Each step holds either a Pattern number or Fill. Each Song remembers the tempo at which it was last played.

5.1A Select Songs and Enter/Exit Song Mode

1. The SR-16 should be in Song mode.
2. Select PERFORM mode.
3. Enter a two-digit Song number with the number or INC/DEC buttons. Song numbers must always include two digits; enter a leading zero if necessary.
4. Press PLAY to begin playback. Press STOP to stop playback.
5. To exit Song mode and return to Pattern mode, first stop the Song with the STOP button, then press the PATTERN/SONG button.

5.1B Set Song Tempo

The tempo range extends from 20 to 255 beats per minute. Song tempo can be changed while the SR-16 is stopped or running, and the Song remembers the last tempo that was chosen. There are two ways to set tempo.

1. Before pressing PLAY to start a Song, tap the STOP button several times at the desired tempo. The SR-16 will average the time between taps and derive a tempo; the display will update the tempo with each tap. If a footswitch is plugged into the Count/A/B/Fill jack, tapping the footswitch at the desired rate is equivalent to tapping the STOP button. These techniques work only if the SR-16 is stopped.
2. Use the TEMPO/PAGE up and down buttons. Press once to increment/decrement respectively 1 BPM at a time, or press and hold to scroll through the tempo values.

Background While in Pattern mode, the tempo remains as is until changed. If you switch over to Song mode and the programmed Song tempo is different, the SR-16 will assume the Song's tempo—even if you switch back into Pattern mode—until the tempo is changed again (either manually, or by selecting a different Song).

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5.1C Continue, Re-start, or Jump to Next Song Step

• In Compose mode, if you stop a Song and then press PLAY, the Song will continue from the first beat of the Pattern that was playing when STOP was pressed.
• In Perform mode, if you stop a Song and then press PLAY, the Song will re-start from the beginning.
• In either Compose or Perform mode, press PLAY while the Song is playing to immediately jump ahead to the next Song step. Its associated Pattern will begin on the downbeat. This is a convenient way to "fast forward" over certain parts of a Song.

5.1D "Loop" a Pattern Indefinitely

In Song Perform mode, pressing and holding FILL until the end of a song step will cause that step to repeat. A footswitch plugged into the Count/A/B/Fill jack will perform the same function.

Examples: Use this feature if a soloist decides to take another few bars. Another use is if two Songs share the same tempo. Follow the first Song with a blank Pattern, then append the second Song. Between Songs, hold down the footswitch on the blank Pattern song step, then release to start the second Song.

5.1E Start from the Middle of a Song

You need not start a Song from the beginning each time; in Compose mode, a Song can start at any Song step.

1. Make sure the SR-16 is in Compose mode, even if you don't plan to record anything.
2. Use the INC/DEC buttons to select the Song step at which you want the SR-16 to start playing.
3. Press PLAY. The SR-16 will start playing at the downbeat of the selected Song step.
4. If you don't want to extend the Song length, go into Perform mode before reaching the end of the Song. If you do want to extend the Song length, remain in Compose mode.

5.1F Name a Song (NAME)

1. The SR-16 can be in either Compose or Perform mode.
2. Press RECORD SETUP. If the Song has been named, the name will show on the top line. If the Song has not been named, the display says **NO NAME**.
3. Enter the name using the PAGE UP/DOWN buttons to select the character to be changed, and the INC/DEC buttons to select the desired character. Lower case and upper case letters, numbers, punctuation, and various special-purpose characters are available. You can also enter numbers with the number buttons.

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5.1G Change Song Tempo as the SR-16 Plays

To change the Song tempo as it plays, press the TEMPO/PAGE UP button to increase the tempo, and the TEMPO/PAGE DOWN button to decrease the tempo.

5.2 REAL TIME SONG CREATION

To create a Song in real time (this assumes an empty song):

1. (Optional) In Pattern mode, select the Pattern you want for the first Song step.
2. Select Song mode and the desired Song number.
3. Select Compose mode. The display will show **STEP 01** and the contents of the step, which is currently **END** (if the first step says **END**, that indicates that the Song is empty since it contains no data. If the first step shows a **PATT**ern number, then the Song is not empty).
4. If you did not perform step (1) above, enter the desired Pattern for step 1 (Preset or User, A or B, A Fill or B Fill).
5. Press PLAY. If you performed step (1) above, the Pattern you selected will begin playing. Otherwise, the Pattern specified in step (4) above will start playing.
6. If you enter a new Pattern number (Preset or User, A or B) while the first Pattern is playing, the new Pattern will begin playing after the first Pattern has finished and be stored as another Song step in the Song. If you let the original Pattern keep playing, it will add a new Song step with its Pattern number every time it repeats.
7. In addition to selecting different Patterns, you can press FILL at any time. The SR-16 will remember where you pressed FILL.

As in Pattern mode, pressing FILL will automatically transition to the B Pattern if the A Pattern is currently playing (and vice versa), or will continue playing the same Pattern if the FILL button is held past the end of the Fill.

A Fill can transition into any Pattern number, A or B, by specifying the Pattern before the end of the Fill and releasing FILL before the Fill has finished playing. If you hold FILL past the end of the Fill, the associated Main Pattern will continue playing and any Pattern you may have previously specified for the next Step will be forgotten.

When recording a Song in Compose mode, the Count/A/B/Fill footswitch duplicates the FILL button function.

5.2A Real Time Song Editing

If you have already recorded material in a Song, pressing PLAY while in Compose mode will not allow recording until after the last Song step (as indicated by the display switching from **PLAYING** to **RECORDING**). However, you can overdub Fills at any time, and these will be recorded in the Song where played. Under these conditions, holding FILL past the downbeat doesn't make any difference; the Patterns used in Song steps are not altered.

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5.3 MANUAL SONG CREATION

5.3A Enter a Pattern

1. Select Song mode and the desired Song number.
2. Select Compose mode. The display will show **STEP 01** and the contents of the step, which is currently **END** (if the first step says **END**, that indicates that the Song is empty since it contains no data. If the first step shows a **PATT**ern number, then the Song is not empty).
3. Enter a two-digit Pattern number with the number buttons. If desired, choose between the A/B variations and Preset/User options.
4. If you want to enter another Pattern, press the INC button to move to the next step; or press the DEC button to return to a previous step and change its Pattern.

5.3B Add a Fill

1. With the SR-16 in Song and Compose modes, select the step where the Fill is to be added.
2. Press and hold the FILL button.
3. Enter the number of beats and sub-beats after the start of the current step in which the Fill is to start playing with the number buttons and INC/DEC buttons respectively. It is not necessary to press PLAY; the step will remember where the Fill is to occur.
4. As the Song plays the step where the Fill occurs, the display will show **FILL** when the Fill begins playing.

5.3C Remove a Fill

While in Compose mode, there are two ways to remove a Fill from a Song:

• When the Fill step appears, press the A button for an A Pattern or press the B button for a B Pattern and the Fill will be removed.
• When the Fill step appears, press and hold the FILL button and press ERASE.

5.3D Insert a New Step Between Two Existing Song Steps

1. The SR-16 should be in Song and Compose modes.
2. Use the INC/DEC buttons to select the step number that the inserted step should occupy. *Example:* To insert a step after step 04, select step 05.
3. Press and hold COPY, and keep holding it down until step (6). The display says **INSERT**.
4. Enter the two-digit Pattern number to be inserted.
5. Press PLAY. The new step is inserted, and all subsequent steps are automatically re-numbered to reflect the addition of the inserted step *(e.g.,* what used to be step 05 is now step 06, what used to be step 06 is now step 07, etc.).
6. Release the INSERT and PLAY buttons.

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5.3E Delete a Step

1. The SR-16 should be in Song and Compose modes.
2. Use the INC/DEC buttons to select the step number to be deleted.
3. Press and hold ERASE. The display says **ERASE STEP?**
4. While continuing to hold ERASE, press PLAY. The step is deleted, and all subsequent steps are automatically re-numbered to reflect the deletion of the inserted step *(e.g.,* what used to be step 06 is now step 05, what used to be step 07 is now step 06, etc.). The display says STEP ERASED for as long as the ERASE and PLAY buttons are pressed.
5. Release the ERASE and PLAY buttons.

5.3F Replace a Step

1. The SR-16 should be in Song and Compose modes.
2. Use the INC/DEC buttons to select the step number to be replaced.
3. Enter the new Pattern number (with appropriate A or B, Fill, or User/Preset options). Since the step is replaced, no renumbering of subsequent steps occurs.

5.3G Erase an Entire Song

1. The SR-16 should be in Song and Perform modes.
2. Use the number buttons to select the Song to be erased.
3. Press and hold the ERASE button. The display says **SONG ERASE?**
4. While holding down the ERASE button, press PLAY. The display says **SONG ERASED** and erasure is complete.
5. Release the ERASE and PLAY buttons.

5.3H Copy a Song to Itself (Double Song Length)

Copying a Song to itself doubles the Song's length.

1. The SR-16 should be in Song and Perform modes.
2. Select the Song to be copied to itself with the number or INC/DEC buttons.
3. Press and hold the COPY button. The display says **COPY TO SONG** .
4. While continuing to hold the COPY button, enter the same Song number as the one selected in step (2) and press PLAY. The copy is complete, and the display says **COPY DONE**.
5. Release the COPY and PLAY buttons.

5.4I Copy a Song to Another Song (or to the End of Another Song If That Song is Not Empty)

1. The SR-16 should be in Song and Perform modes.
2. Select the Song to be copied with the number or INC/DEC buttons.
3. Press and hold the COPY button, and keep holding it down until step (6). The display says **COPY TO SONG** with the number of the currently selected Song.

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4. While continuing to hold the COPY button, enter the destination Song number to which the source Song should be copied using the number or INC/DEC buttons.
5. While you continue to hold the COPY button down, press PLAY. The copy is complete, and the display says **COPY DONE**.
6. Release the COPY and PLAY buttons.

Notes
• If the destination Song was empty, the copy is identical to the source Song.
• If the destination Song was not empty, then the source Song is appended to the end of the destination Song. This increases the destination Song's length by the length of the source Song; if the total destination Song length would exceed 254 steps after copying, the copy will not take place, and the display will say **SONG TOO LONG**.

5.4J Copy a Song to Another SR-16 Via MIDI

The SR-16 can send Song system exclusive information to another SR-16 via MIDI. If you have only one SR-16, you can skip this section.

1. The source SR-16 should be in Song mode and stopped. Connect the source SR-16 MIDI out to the destination SR-16 MIDI in.
2. Select the Song to be copied.
3. Press and hold the COPY button, and keep holding it down until step (5). The display says **COPY TO SONG**.
4. Do not enter any destination Song number—just press PLAY to send the data out over MIDI. It will end up in whatever Song number had been selected at the receiver. If the Song was not empty, the new Song steps will be appended to the existing Song steps.
5. Release the COPY and PLAY buttons.

Caution: This does not transfer Pattern information, only the song steps. To transfer Patterns to another SR-16, see section 3.3D and 3.3E.

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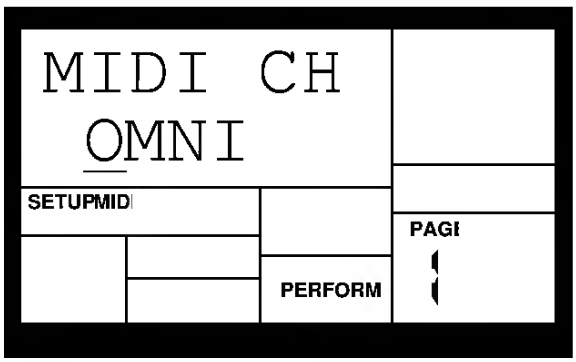
CHAPTER 6: MIDI SETUP

This menu accesses important MIDI functions. General instructions are:

1. Press the MIDI SETUP button.
2. Use the Page (up and down) buttons to select different "pages" of functions; the display's lower right window shows the page number. These pages are described below.
3. Adjust values on pages, if necessary, as described for each page.
4. After making all needed changes, press MIDI SETUP again to exit, or choose another page.

All the parameters on the following pages remain as set, even if you turn off power, until changed.

6.1 PAGE 1: SELECT MIDI CHANNEL (MIDI CH)



The display shows the **MIDI CH**annel (1-16) or Omni. Enter the desired value with the number or INC/DEC buttons. (With the number buttons, enter a leading zero if necessary; 00 selects Omni mode.)

Background The SR-16 can receive and transmit MIDI data in Omni mode (receives data appearing on any of the 16 MIDI channels; transmits data over channel 1) or Poly mode (transmits *and* receives over any one of the 16 MIDI channels).

Use Omni when playing the SR-16 from an external MIDI controller (MIDI drum pads, MIDI keyboard, etc.) since it's not necessary to match channels. When several instruments are being driven by MIDI *(e.g.,* when a sequencer sends out data over several channels to different instruments), use Poly mode so that the SR-16 tunes in to only the channel containing drum data.

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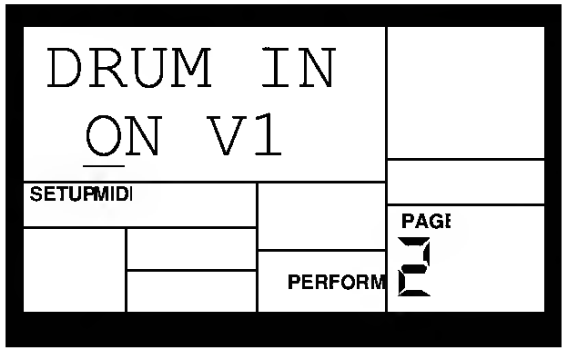
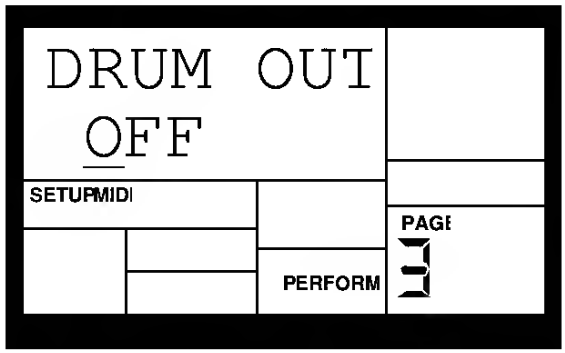
6.2 PAGE 2: RECEIVE MIDI DRUM NOTES (DRUM IN)



The display shows **DRUM IN**. This page features two different MIDI input velocity curves (**ON V1** and **ON V2**). To have the SR-16 receive note messages at its MIDI input, use the INC/DEC buttons to select **ON V1** or **ON V2**. Select **OFF** to have the SR-16 ignore note messages. **ON V1** is a normal linear velocity curve, and will not affect MIDI velocity data being sent by the controller. For keyboards that do not provide a full range of velocity (such as the Yamaha DX7), **ON V2** will allow the drums to be played at full volume without having to send full velocity from the MIDI controller.

Background Select **ON V1** or **ON V2** if you're using the SR-16 as an expander module, or want to play real time drum controllers into the SR-16 as it plays a Pattern or Song. Select **OFF** if you're using the SR-16 as a drum machine slaved to a sequencer; when **OFF**, the SR-16 follows the sequencer timing data but not note data (you don't want it to play other parts). Note that Clock In (page 5) must be on.

6.3 PAGE 3: TRANSMIT MIDI DRUM NOTES (DRUM OUT)



The display shows **DRUM OUT**. To have the SR-16 output MIDI note data from pad hits or when playing a Pattern/Song, use the INC/DEC buttons to select **ON**. Select **OFF** if you don't want the SR-16 to transmit note data.

Background Select **ON** to send Pattern data into a sequencer for recording, or drive other drum sound expander modules. If the SR-16 is acting as a drum machine and provides the master clock to a MIDI system, select **OFF** so that other devices don't respond to the MIDI note data.

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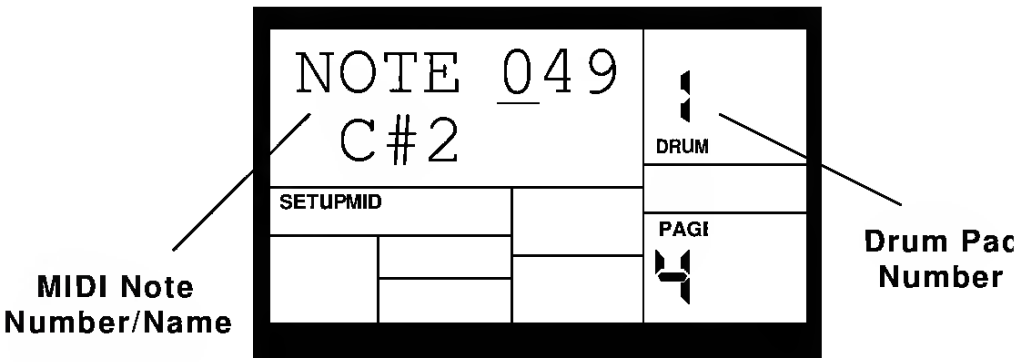
6.4 PAGE 4: ASSIGN MIDI NOTE NUMBERS TO DRUM PADS (NOTE)

This page determines which MIDI in **NOTE** will trigger a pad, or MIDI out note will be produced if you play a pad. The display shows the note number/name in the upper left, and the drum pad number in the upper right window.



Play the drum pad to be assigned to a MIDI note, as confirmed by the Drum Pad Number display. Enter the note number/name with the number or INC/DEC buttons.

Background Note assignments are "global" and affect every Pattern. MIDI note assignments are not individually selectable for each Pattern.

The default note assignments are:

Drum/Pad	MIDI Note #	Key Name
Kick	036	C1
Snare	038	D1
Cls Hat	042	F#1
Open Hat	046	A#1
Claps	039	D#1
Perc 2	067	G3
Tom 1	048	C2
Tom 2	045	A1
Tom 3	041	F1
Ride	051	D#2
Crash	049	C#2
Perc 1	065	F3

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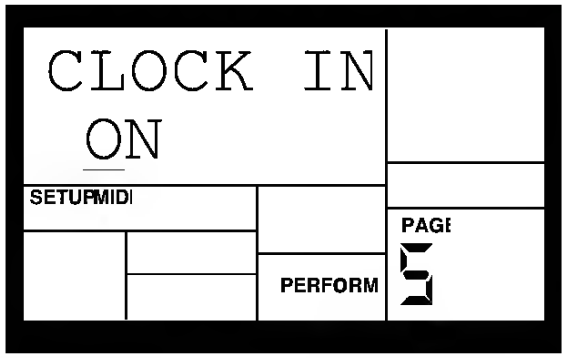
6.5 PAGE 5: ACCEPT EXTERNAL CLOCK DATA (CLOCK IN)



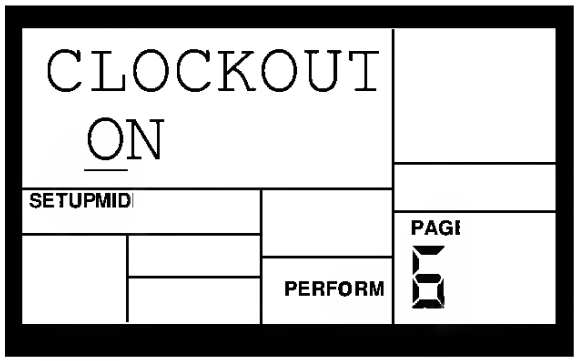
The display shows **CLOCK IN**. To have the SR-16 recognize clock (timing) messages present at its MIDI input, use the INC/DEC buttons to select **ON** (if no clock messages are present, the SR-16 will follow its internal clock tempo). Select **OFF** to have the SR-16 ignore clock messages and follow its internal clock tempo regardless of what timing data appears at the MIDI in.

When using the SR-16 as an expander module, set **CLOCK IN** to **OFF** so that timing signals don't start playing a Pattern.

Background The SR-16 can have its tempo set by another device (this overrides the internal clock tempo) if:

- The external device (sequencer, drum machine, etc.) generates MIDI timing signals.
- These signals go from the external device's MIDI out to the SR-16's MIDI in.
- **CLOCK IN** is **ON**.

6.6 PAGE 6: SEND CLOCK DATA TO OTHER DEVICES (CLOCKOUT)



The display shows **CLOCKOUT**. To have the SR-16 generate timing data at its MIDI out, use the INC/DEC buttons to select **ON**. Select **OFF** to inhibit MIDI timing signals from appearing at the MIDI out jack.

Background The SR-16 can generate timing signals to which other devices can synchronize if:

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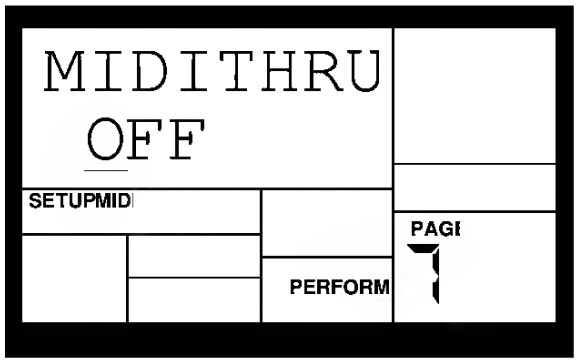
• The external device (sequencer, drum machine, etc.) can respond to MIDI timing signals.
• These signals go from the SR-16's MIDI out to the external device's MIDI in.
• **CLOCKOUT** is **ON**.

When slaving the SR-16 to other devices, **CLOCKOUT** should be **OFF** and **CLOCK IN** should be **ON**.

6.7 PAGE 7: MERGE MIDI IN WITH MIDI OUT (MIDITHRU)



The display shows **MIDITHRU**. To have the SR-16 merge data appearing at the MIDI in with the timing and/or note data appearing at the MIDI out, use the INC/DEC buttons to select **ON**. Select **OFF** to have the SR-16 MIDI out carry SR-16 timing and note data only.

Background Turning MIDI out to MIDI thru can be handy for some system applications. *Example:* Assume a MIDI keyboard connects to the SR-16 MIDI in. The SR-16 serves as the master clock for an MMT-8 sequencer; the SR-16 MIDI out connnects to the MMT-8 MIDI in. With **MIDITHRU** set to **ON**, the keyboard note data will be passed through the SR-16 and appear at the MMT-8 MIDI in.

Other SR-16 settings should be **DRUM IN OFF** (so the SR-16 doesn't respond to your keyboard playing) and **CLOCKOUT ON** so that the SR-16 clock drives the MMT-8. **DRUMOUT** should also be **OFF** so that the MMT-8 doesn't record the SR-16 drum notes. Plugging the MMT-8 MIDI out to the keyboard MIDI in plays back the sequenced notes through the keyboard.

Technically speaking, MIDI timing data (as provided by a master unit such as a sequencer) received at the SR-16's MIDI in is not sent to the MIDI out. However, this will appear to be the case since the SR-16 will generate its own timing data in response to the timing data received at its MIDI in, if **CLOCK IN** and **CLOCK OUT** are both **ON**.

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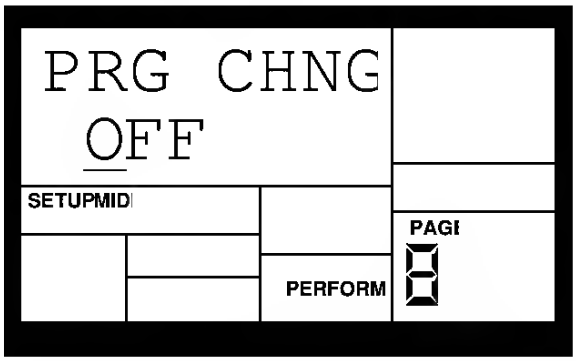
6.8 PAGE 8: SELECT DRUM SETS VIA MIDI PROGRAM CHANGES (PRG CHNG)



The display shows **PRG CHNG**. Program Change commands can change Drum Sets numbers at any time, including while the SR-16 is playing. To have the SR-16 receive Program Changes, use the INC/DEC buttons to select **ON**. Select **OFF** to have the SR-16 ignore Program Changes.

Background Program Change (PC) 00 selects User Drum Set 00; PC 01 selects User Drum Set 01; PC 02 selects User Drum Set 02; etc. *Caution!* Some units number Program Changes as 1-128, others as 0-127, and some as banks of programs. If the device generating Program Changes follows a non-standard protocol, it's a good idea to make up a conversion chart that shows which Program Changes call up which Drum Sets.

Program Changes 00-49 select the 50 User Drum Sets. Program Changes 50-99 select Preset Drum Sets 00-49. Program Changes 100-127 select User Drum Sets 00-27.

The current Pattern will remember whatever Drum Set is selected via Program Changes, just as if you had selected it manually, unless the SR-16 is in Manual mode (described in Page 9 of the Drum Set menu).

If Program Change is enabled, and the SR-16 is in **MULTI-DRUMSET** mode (see section 6.9 below), and a program change is received in the 00-49 range, the SR-16 will automatically select the drumset group corresponding to the program change number. For example, if program 36 is received with the above conditions met, the note map will change to drumset group 30-39.

6.9 PAGE 9: MAP DRUM NOTES (NOTE MAP)

Within each Pattern, MIDI notes can either be mapped to 12 different sounds in **NORMAL** mode,.or they can be mapped to any of five drumset groups (User Drumsets 00-09, 10-19, 20-29, 30-39, and 40-49) in **MULTI-DRUMSET** mode. Any of these drumset groups can cover MIDI notes 000 through 119. This makes the SR-16 ideal for use as a drum sound module, triggered by either an electronic drum kit or set of electronic drum pads, or by notes from a sequencer.

Note that while in this mode, you cannot record notes into a Pattern via MIDI. It is assumed that you will be using the SR-16 strictly as a drum sound expander module.

The chart on the following page shows which drum pads of which drum sets are triggered by which MIDI notes. The logic to this assignment is that there are 12 drum pads per octave of notes, so pad 1 always starts on a C note (MIDI notes 000, 012, 024, 036, 048, 060, 072, 084, 096, and 108). Remember that these drum assignments must be saved as Drum Sets in order to retain the note map assignments.

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Drum Set	Pad #	MIDI Note	Drum Set	Pad #	MIDI Note	Drum Set	Pad #	MIDI Note
00	1	000	03	5	040	06	9	080
00	2	001	03	6	041	06	10	081
00	3	002	03	7	042	06	11	082
00	4	003	03	8	043	06	12	083
00	5	004	03	9	044	07	1	084
00	6	005	03	10	045	07	2	085
00	7	006	03	11	046	07	3	086
00	8	007	03	12	047	07	4	087
00	9	008	04	1	048	07	5	088
00	10	009	04	2	049	07	6	089
00	11	010	04	3	050	07	7	090
00	12	011	04	4	051	07	8	091
01	1	012	04	5	052	07	9	092
01	2	013	04	6	053	07	10	093
01	3	014	04	7	054	07	11	094
01	4	015	04	8	055	07	12	095
01	5	016	04	9	056	08	1	096
01	6	017	04	10	057	08	2	097
01	7	018	04	11	058	08	3	098
01	8	019	04	12	059	08	4	099
01	9	020	05	1	060	08	5	100
01	10	021	05	2	061	08	6	101
01	11	022	05	3	062	08	7	102
01	12	023	05	4	063	08	8	103
02	1	024	05	5	064	08	9	104
02	2	025	05	6	065	08	10	105
02	3	026	05	7	066	08	11	106
02	4	027	05	8	067	08	12	107
02	5	028	05	9	068	09	1	108
02	6	029	05	10	069	09	2	109
02	7	030	05	11	070	09	3	110
02	8	031	05	12	071	09	4	111
02	9	032	06	1	072	09	5	112
02	10	033	06	2	073	09	6	113
02	11	034	06	3	074	09	7	114
02	12	035	06	4	075	09	8	115
03	1	036	06	5	076	09	9	116
03	2	037	06	6	077	09	10	117
03	3	038	06	7	078	09	11	118
03	4	039	06	8	079	09	12	119

Drum note map in **MULTI-DRUMSET** mode

NOTE: In this chart, Pad and MIDI note number values for drumset 00 also apply to drumsets 10, 20, 30, and 40; values for drumset 01 also apply to drumsets 11, 21, 31 and 41, etc.

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CHAPTER 7: BACKUP

7.1 BACKUP BASICS

This function allows you to save the SR-16 Pattern, Song, and Drum Kit data to cassette tapes or MIDI system exclusive storage devices. General instructions are:

1. Press the BACKUP button.
2. Use the Page (up and down) buttons to select different "pages" of functions; the display's lower right window shows the page number. These pages are described below.
3. Adjust values on pages, if necessary, as described for each page.
4. After performing the desired backup operation, press BACKUP again to exit, or choose another page.

With all tape operations, pressing STOP during a data transfer cancels the operation from that point on, as indicated by the display (**TAPE OUT CANCEL** when saving, **TAPE IN CANCEL** when verifying or loading). If you press STOP during a load from tape, the memory contents may end up partially full, thereby resulting in jumbled data for some Patterns or Songs. However, if you're loading a single Pattern or Song, you can press STOP any time after the desired Pattern or Song has loaded.

If an error occurs while loading, the display will say **ERROR**; loading continues but the data may be unuseable. Try reloading an alternate take of the data. If the tape stops or a dropout lasts long enough for the SR-16 to think the tape has stopped, the transfer will be cancelled (the display says TAPE IN CANCEL).

Background The SR-16 can save the data in memory by converting this data into audio tones and recording these tones on a standard audio tape machine (usually cassette). Data can also be converted into a special type of MIDI code and stored in a MIDI data storage device such as the Alesis DataDisk, or transferred to another SR-16. As you build up a library of Patterns and Songs, data can be reloaded from tape or MIDI into the SR-16. There are two main reasons to save your work:

• Although the SR-16 can typically store over 15,000 events, eventually it will run out of memory. You can save the memory contents, fill up the memory with new Patterns and Songs, and re-load the old data when needed.
• **It is vitally important to back up what's in the SR-16's memory!** A mechanical problem (surge on the power line, a quick zap of static electricity) or operator error could alter the data in memory. *Save your data whenever you've done enough work on something that you wouldn't want to lose that work.* If possible, make two backups, and store the second backup in a different physical location from the primary backup.

Caution! Saving and loading data is very unreliable when done incorrectly, and very reliable when done right. To promote error-free saves and loads, use a high-quality recorder and tape.

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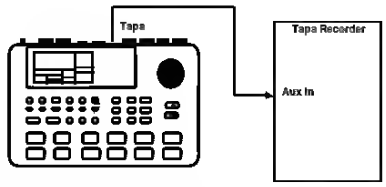
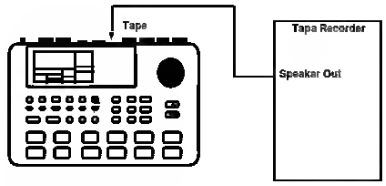
7.2 TAPE INTERFACE HOOKUP

To save to tape: Connect a mini phone plug cable (male-to-male) from the SR-16 tape in/out to the recorder's tape in. If you are using a standard cassette recorder rather than a data recorder, plug into the recorder's Aux or Line Level input. If your only option is to plug into the microphone input, you may still be able to achieve satisfactory results.



To verify a save, or load data from tape: Connect a mini phone plug cable (male-to-male) from the recorder's speaker or line out to the SR-16's tape in/out.



7.3 PAGE 1: SEND DATA AS MIDI TO A MIDI SYS EX STORAGE DEVICE (SEND OUT MIDI?)

The display shows **SEND OUT MIDI?** To convert the SR-16's Pattern and Song information into MIDI system exclusive data and send this data through the MIDI out, press the PLAY button. The display will say **SENDING MIDI...** to confirm that data is being sent. Typically, the MIDI out would connect to another SR-16's MIDI in or a system exclusive data storage device such as the Alesis DataDisk. The SR-16 data can take up as much as 35K, allowing it to be captured by most system exclusive storage devices.

After the transfer is complete, the SR-16 display reverts to either Song or Pattern mode (whichever had been selected prior to saving).

Background The SR-16's memory contents can be sent out over MIDI like any other MIDI data. This data is meaningful only to an SR-16 (different drum machines will ignore the data) but the data can be saved to a MIDI system exclusive storage device, such as the Alesis DataDisk, a computer running System Exclusive storage software, or a musical instrument capable of recording System Exclusive data (Yamaha SY77 and DX7IIFD, Ensoniq EPS and VFX, Peavey DPM-3, etc.). This function also lets you send all Patterns, Songs, and Drum Setups to another SR-16 without having to save to tape first.

The following describes how to save data to the Alesis DataDisk; other system exclusive storage devices work similarly, but please refer to the owner's manual for your particular device to find out how to set it up to accept and store MIDI data.

Saving to DataDisk

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1. Connect the SR-16 MIDI out to the DataDisk (DD) MIDI in.
2. Insert a formatted disk into the DD and proceed to the next step. If the disk is not formatted, insert it in the drive and press the DD Format switch. When the DD display says FORMAT DISK?, press DO/YES. When the display says ARE YOU SURE? press DO/YES again.
3. Press the DD RECEIVE button. The display says RECV ONE SYSEX: WAITING FOR DATA.
4. Press the SR-16 BACKUP button (if you are not already in the backup function) and select Page 1.
5. Press the SR-16 PLAY button. The SR-16 display says SENDING MIDI... and the DD display says RECEIVING Alesis SR-16 to indicate that data has been received.
6. To prevent future confusion, name the DD file using the DD NAME function.

7.4 RECEIVE DATA DIRECTLY FROM ANOTHER MIDI DEVICE

The SR-16 will automatically load SR-16 system exclusive data present at its MIDI input. Therefore, there is no associated function page since reception can occur at any time that a sys ex storage device or another SR-16 sends data through its MIDI out into the SR-16's MIDI in. If the SR-16 receives sys ex while a Pattern or Song is playing, the Pattern or Song will stop. Song 99 will be selected once the dump is finished.

The SR-16 is compatible only with SR-16 system exclusive data; for example, you cannot load system exclusive data from another drum machine into the SR-16.

The following describes how to load data from the Alesis DataDisk; other system exclusive storage devices work similarly, but please refer to the owner's manual for your particular device to find out how to set it up to send MIDI sys ex data.

NOTE: When loading a single drum set in sys ex, be sure and save the set to a user drum set memory location before changing patterns. If you change Patterns before saving the drum set, the drum set will be lost.

Loading from DataDisk

1. Connect the DD MIDI out to the SR-16 MIDI in.
2. Insert the disk into the DD that contains the file to be loaded into the SR-16.
3. Press the DD SEND button. The display says SEND FILE Alesis SR-16 (filename)?
4. Press the DD DO/YES button. The SR-16 automatically senses the presence of this data; no button-pushing is required. The DD display says SENDING: Alesis SR-16 (filename), the SR-16 display says LOADING MIDI. Note that loading sys ex data overwrites all existing SR-16 memory.
5. The SR-16 will now be set to Song 99.

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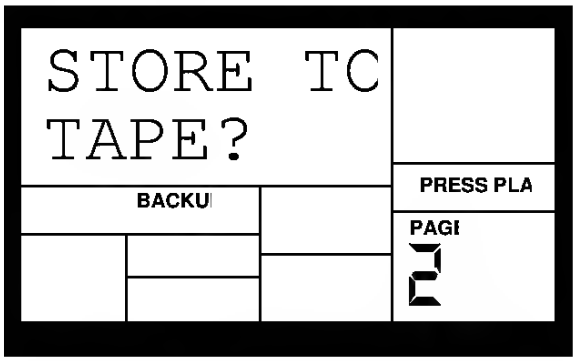
7.5 PAGE 2: SAVE ALL MEMORY CONTENTS TO TAPE (STORE TO TAPE?)

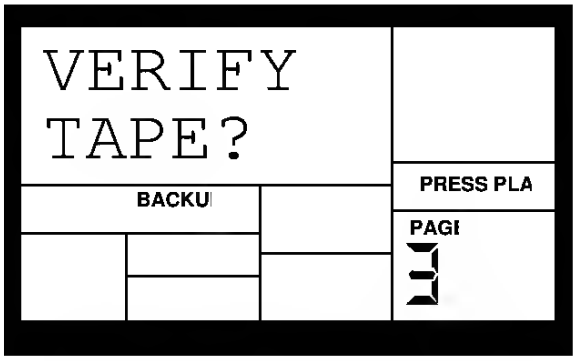


This function saves all Patterns, Songs, and Drum Kits to tape. The display shows **STORE TO TAPE?** Put the cassette recorder into record mode. After the tape has gone past the leader (if present), press PLAY on the SR-16. The SR-16 display will increment through the A/B Patterns and Songs; the operation is finished when the display says **DONE**. It's a good idea to save data several times in case part of the tape becomes damaged.

To cancel the saving operation at any time, press STOP. The display says **TAPE OUT CANCEL**.

Remember that you can save data to any tape medium. For example, recording drum part data at the head of a multi-track master is often convenient, as it stores the drum parts used on a song with that song.

7.6 PAGE 3: VERIFY DATA RECORDED ON TAPE (VERIFY TAPE?)



The display says **VERIFY TAPE?** Press PLAY; the display says **START TAPE...**

Press the recorder's Play button. While checking, the display shows the current Pattern or Song being verified, until all data has been checked. When the tape has been verified, the display says **DONE**.

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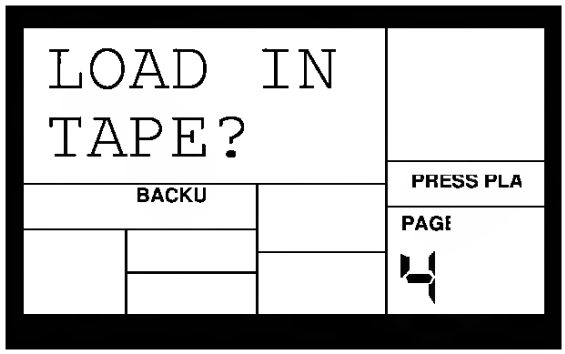
To cancel the verifying operation at any time, press STOP. The display says **TAPE IN CANCEL**.

Background Although cassette interfaces are quite reliable, problems can occur due to incorrect tape levels, defective tape, bad luck, etc. Do not consider your work as saved until you have verified the data recorded on tape, thus insuring that it can be loaded back into the SR-16 in the future.

Unlike some other cassette interfaces, this function verifies that the data on tape is valid, not necessarily that it's the same data as what's in the machine. In other words, the verify function does not work by checking the tape data and SR-16 data for similarities. Therefore, you can verify tape data at any time.

7.7 PAGE 4: LOAD DATA FROM TAPE (LOAD IN TAPE?)



This loads all data stored in the tape dump being loaded. The display says **LOAD IN TAPE?** Press PLAY; the display says **START TAPE...**

Press the recorder's Play button. While loading, the display shows the current Pattern or Song being loaded, until all data has been loaded. Upon completion the display says **DONE**.

Background This function reloads a Bank of Patterns and Songs stored on tape back into the SR-16. Data loaded from tape will take its original position in memory *(e.g.,* SONG 15 will reload back into SONG 15). Loading all Patterns and Songs overwrites all existing data in memory, so if necessary, save your current work before loading.

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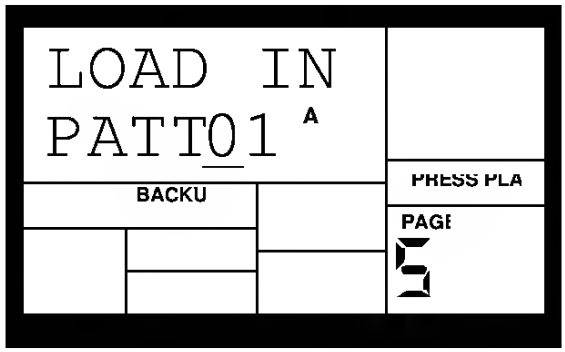
7.8 PAGE 5: LOAD ONE PATTERN FROM TAPE (LOAD IN PATT)



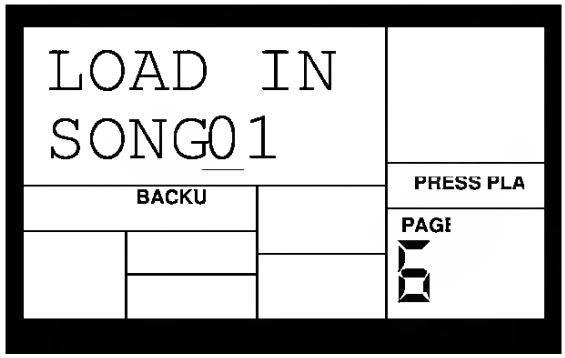
This loads a single Pattern from a tape dump. The display says **LOAD IN PATT00**. Enter the desired Pattern number with the number or INC/DEC buttons, press the A or B button to specify the desired variation, then press PLAY; the display says **START TAPE...**

Press the recorder's Play button. While loading, the display shows the Pattern being loaded. Upon completion the display says **DONE**.

Background You may just want to load one Pattern from tape rather than all data. A Pattern being loaded from tape will take its original position in memory *(e.g.,* PATT 01B will reload back into PATT 01B) and will overwrite any data currently stored in that location.

Remember that loading a Pattern also loads its associated Fill.

7.9 PAGE 6: LOAD ONE SONG FROM TAPE (LOAD IN SONG)



This loads a single Song of Patterns (not the Patterns used in the Song) from a tape dump. The display says **LOAD IN SONG00**. Enter the desired Song number with the number or INC/DEC buttons, then press PLAY; the display says **START TAPE...**

Press the recorder's Play button. While loading, the display shows the Song being loaded. Upon completion the display says **DONE**.

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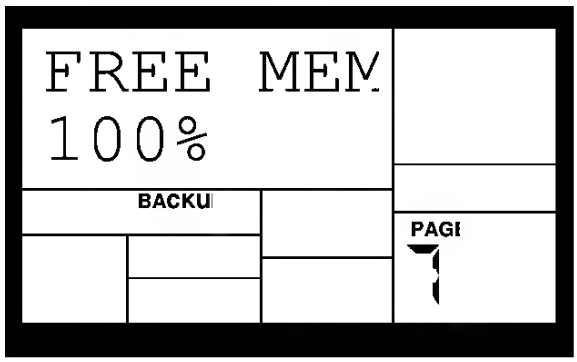
Background You may just want to load one Song from tape rather than all data. A Song being loaded from tape will take its original position in memory *(e.g.*, SONG 32 will reload back into SONG 32) and will overwrite any data currently stored in that location.

7.10 PAGE 7: CHECK AVAILABLE MEMORY (FREE MEM)



When you select Page 7, the display will show the approximate amount of free memory available (expressed as a percentage of the total amount).

Background It is important to check memory from time to time because the SR-16 always requires some free memory for proper operation. If the available memory falls below 15% or so, immediately save the SR-16's data as previously described in this chapter.

Some operations may not be possible even if a small amount of memory is left. This is because the SR-16 duplicates a Pattern before it is modified (length change, offset change, etc.). If you try to alter a Pattern that takes up more memory than is available, the display will tell you that there is no more memory left.

Immediately save the SR-16's data, and determine whether you can erase any unwanted Patterns or Songs to free up some memory.

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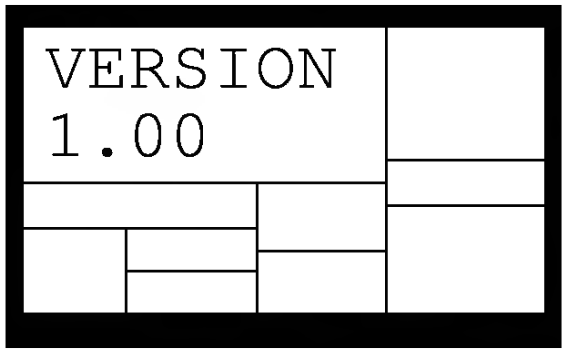
7.11 CLEAR MEMORY/RE-INITIALIZE PARAMETERS

After saving a bank of data, you may want to start programming new Patterns from scratch so you don't mix up new Patterns with old ones. This operation clears the memory and re-initializes all parameters. It can also be a useful service technique to restore the SR-16 to normal operation if it "locks up" due to some unforeseen event like a static electricity jolt or power supply interruption.

All existing Patterns, Songs, and drum assignments will be lost when you clear memory. Save the SR-16's memory to tape or MIDI unless you are absolutely sure you don't need it.

To re-initialize, turn off power and wait a few seconds. Press and hold the PLAY and ERASE buttons while turning on power. Continue holding these buttons down for at least three seconds after turning on power.

7.12 CHECK SOFTWARE VERSION



To determine the software version in your SR-16, press the FILL button at any time you're in the Backup menu. The display will show **VERSION** and the current software number.

Background There are two main reasons why it's important to know the software version.

• It is possible that the SR-16's operating system software may undergo changes or other enhancements at some point in the future. This will let you know whether you have the enhanced software or not.
• Should you experience problems with the SR-16 and call Alesis for technical support, it is important to know which software your machine is using.

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CHAPTER 8: APPLICATIONS

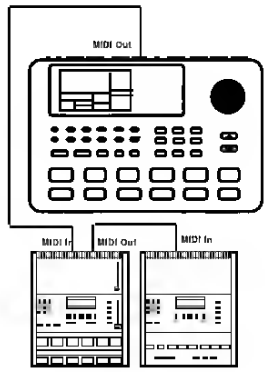
8.1 MIDI SYNC APPLICATIONS

8.1A SR-16 As MIDI Timing Master

The SR-16 can control several other slave MIDI drum machines or sequencers by turning on MIDI Clock Out, which sends SR-16 timing information down the MIDI line.

1. Turn on MIDI Clock Out (section 6.6).
2. Program the slave units to not follow their internal clocks, but to accept external MIDI Clock and Start/Stop data. Refer to each device's manual to find out how to do this. Enable the slave's Song Position Pointer if it is available (or it may be available all the time and not need to be specifically enabled, as is the case with the Alesis HR-16 and MMT-8).
3. Press PLAY on the SR-16. The slave units should start at the same time, and progress at the same tempo. If the slaves respond to Song Position Pointer, you can start an SR-16 Song at any point, and after a few seconds the slaves will catch up and synchronize from that point on.

The following diagram shows an SR-16 serving as the MIDI system master clock, with an HR-16 drum machine and MMT-8 sequencer set as slaves. Note that both devices must be set to accept external MIDI clock messages.



8.1B SR-16 as MIDI Timing Slave

The SR-16 can slave to a MIDI master clock source by turning on Clock In. *Example:* This lets you slave the SR-16 to a MIDI sequencer on which you have recorded other instruments.

1. Set the SR-16 Clock In to on (Section 6.5).
2. Make sure the master is set to generate MIDI timing data (refer to the unit's manual for specific instructions on how to do this). Enable Song Position Pointer if necessary.

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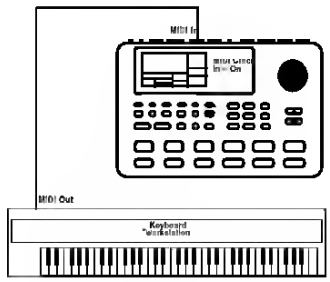
3. Press PLAY on the system master. The SR-16 should start at the same time, and progress at the same tempo. If the master generates Song Position Pointer, you can start the master at any point, and both units will synchronize from that point on.

The following diagram shows an SR-16 slaved to the MIDI system master clock, provided in this case by a keyboard "workstation" on-board sequencer.



8.1C Synching to Synthesizer Sequencers

Many synthesizers include built-in sequencers (Ensoniq EPS16+ and VFX-SD, Roland D-20, Korg M1 and T1, Peavey DPM-3, etc.). You can use the SR-16 as a drum expander module and record the required notes in one of the sequencer tracks. Or, record a Song in the SR-16, and sync it to the keyboard sequencer's timing data so you don't need to use up a sequencer track.

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8.2 STRATEGIES FOR ASSEMBLING PATTERNS AND SONGS

Ideally, you should be able to translate your inspirations into tangible form with a minimum amount of effort. The following tips and techniques help speed up the process of creating Patterns and Songs.

8.2A Create Fills Quickly with the Copy Function

Many times a Fill will simply be a variation on another Pattern, but with a few minor differences to add variety or serve different musical purposes. To save time, use the Copy function to copy the main Pattern to the Fill, then add variations to the Fill in real time or with Step Edit mode.

8.2B Assemble Short Patterns into Longer Patterns with the Copy Function

It's less time-consuming to work with short Patterns, since you don't have to wait for the entire Pattern to cycle through before overdubbing or "spot erasing" events. After assembling several short Patterns, use the copy function to append Patterns into a longer Pattern. *Example:* Create four eight-beat Patterns, then use the copy function to combine these into a single 32-beat Pattern.

8.2C Save Memory Through Song Steps

Whenever possible, repeat Patterns using Song steps rather than program long Patterns. *Example:* Suppose you have a 16-measure figure where the first three groups of four measures are identical, and the final group of four measures provides some sort of variation. Recording this as one 16-measure Pattern will take up more memory than recording two Patterns (one of the first group of four measures and one of the last group of four measures), and while in Song mode repeating the first group three times followed by the last group once.

8.2D Odd Time Signatures

For time signatures based on quarter notes, changing the number of beats in a Pattern can also change the time signature. *Example:* Programming a Pattern length seven beats long will yield a measure of 7/4. Programming a Pattern length 14 beats long will yield two measures of 7/4. Time signatures such as 2/4, 3/4, 5/4, 9/4, and so on are easy to implement.

For time signatures based on eighth notes, it's easiest to double the tempo so that each beat lasts an eighth note instead of a quarter note. However, you will have to take this into account when quantizing and setting the metronome—if the display says a quarter note, read it as an eighth note.

Plan carefully when mixing odd time signatures within the same piece. If some Patterns use a time signature based on quarter notes and others on eighth notes, you will need to double the tempo for the quarter note-based Patterns to match up with the eighth-note based Patterns.

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8.3 SOUND STACKING™

8.3A Basics

Sound Stacking™ was introduced by Alesis on its two earlier drum machines, the HR-16 and HR-16:B. It is a quick and efficient way of layering drum sounds to create thicker drum textures and gives the user wide capabilities for experimenting with new, personalized drum sounds. Through some intelligent software manipulation, a drum sound's rhythm pattern can be copied to any other drum pad thereby simultaneously triggering the drum sounds assigned to both pads. You can stack as many sounds as there are drum pads, but you'll most often need to have enough drum groups to create a drum set. Typically, the snare would be stacked with one or two other sounds and the kick might be stacked with one other sound. Of course, the actual use is totally up to you, but the possibilities are endless.

The operation is a simple copy function performed when the SR-16 is in stop mode and can be done at any time: while developing a rhythm pattern, during mixdown, if you're driving the SR-16 live through MIDI, or stack sounds on the SR-16's preset rhythm patterns. In conjunction with the SR-16's mix, pan, and tune functions, you can customize the drum sound to the specific needs of the song you are working on. This kind of flexibility makes the SR-16 a powerful production tool in the critical decision making process that gives personality to recorded music.

8.3B Sound Stacking when Using the SR-16 as a Drum Machine

When used as a drum machine, one pad's rhythm can be copied to another pad so that as the Pattern plays, both pads double a part (use the directions in section 3.3B to perform Sound Stacking). You can also copy the rhythm to additional pads if desired.

8.3C Editing Stacked Combinations

Remember that the stacked sounds can be further modified with the Drum Set parameters. *Example:* Timbale could be stacked with a snare, but mixed a bit lower than the snare to give the snare sound a "ring" without overpowering it.

Tuning changes can also be very effective. *Example:* Slightly detune two identical drums to create a thicker sound.

8.3D Sound Stacking via MIDI

When using the SR-16 as an expander module, each pad responds to a particular MIDI note number. Assigning two pads to the same note number (section 6.4) stacks those two pads into one combined sound (as triggered by the assigned MIDI note number). You are not limited to assigning two pads to the same note number—trigger all the pads from one MIDI note if you dare.

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8.4 UNDERSTANDING RHYTHMIC NOTATION

Measures A piece of music is divided into smaller units called *measures* (also called *bars*), and each measure is divided into *beats*. In the SR-16, each beat is further sub-divided into 96 sub-beats.

Rhythmic Values for Notes With a measure written in a 4/4 time signature, there are 4 beats per measure, and each beat represents a quarter (1/4) note. Thus, there are 4 quarter notes per measure of 4/4 music. With a 3/4 time signature the "numerator" indicates that there are 3 beats per measure, while the "denominator" indicates that each of these beats is a quarter note (1/4).

There are two *eighth notes* per *quarter note*. Thus, there are eight eighth notes per measure of 4/4 music.

There are four *16th notes* per quarter note. Thus, there are sixteen 16th notes per measure of 4/4 music.

There are eight *32nd notes* per quarter note. Thus, there are thirty-two 32nd notes per measure of 4/4 music.

There are also notes that span a greater number of beats than quarter notes. A *half note* equals two quarter notes. Therefore, there are two half notes per measure of 4/4 music. A *whole note* equals four quarter notes, so there is one whole note per measure of 4/4 music. (We keep referring these notes to 4/4 music because that is the most commonly used time signature in contemporary Western music.)

Triplets The above notes divide measures by factors of two. However, there are some cases where you want to divide a beat into thirds, giving three notes per beat. Dividing a quarter note by three results in *eighth-note triplets*. The reason why we use the term eighth-note triplets is because the eighth note is closest to the actual rhythmic value. Dividing an eighth note by three results in *16th-note triplets*. Dividing a 16th note by three results in *32nd note triplets*.

Rests You can also specify where notes should *not* be played; this is indicated by a *rest*, which can be the same length as any of the rhythmic values used for notes.

Dotted Notes and Rests Adding a dot next to a note or rest means that it should play one-and-one-half times as long as the indicated value. This of course does not apply to percussion parts. *Example:* A dotted eighth note would last as long as three 16th notes (since an eighth note is the same as two 16th notes).

Uncommon Time Signatures 4/4 (and to a lesser extent 3/4) are the most common time signatures in our culture, but they are by no means the only ones. In jazz, both 5/4 (where each measure consists of five quarter notes) and 7/4 (where each measure consists of seven quarter notes) are often used. In practice, complex time signatures are played like a combination of simpler time signatures; for example, some 7/4 compositions would have you count each measure not as 1, 2, 3, 4, 5, 6, 7 but as 1, 2, 3, 4, 1, 2, 3. It's often easier to think of 7/4 as one bar of 4/4 followed by one bar of 3/4 (or the other way around, depending on the phrasing), since as we mentioned, 4/4 and 3/4 are extremely common time signatures.

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CHAPTER 9: MIDI SUPPLEMENT

(This chapter is adapted with permission from *Power Sequencing with Master Tracks Pro/Pro 4* and *The Complete Guide to the Alesis HR-16 and MMT-8*, copyright 1990 and 1989 respectively by AMSCO Publications.)

9.1 MIDI BASICS

Most current electronic instruments, including the SR-16, contain an internal computer. Computers and music have been working together for decades, which is not surprising considering music's mathematical basis (consider frequencies, harmonics, vibrato rates, tunings, etc.). In the mid-70s, microcomputers became inexpensive enough to be built into consumer-priced musical instruments. They were used for everything from sound generation to storing parameters in memory for later recall.

In 1983, the MIDI (Musical Instrument Digital Interface) specification was introduced to better exploit the computers inside these new musical instruments, primarily to insure compatibility with equipment from other manufacturers. MIDI expresses musical events (notes played, vibrato, dynamics, tempo, etc.) as a common "language" consisting of standardized digital data. This data can be understood by MIDI-compatible computers and computer-based musical instruments.

Before electronics, music was expressed exclusively as written symbols. By translating musical parameters into digital data, MIDI can express not only the types of musical events written into sheet music, but other parameters as well (such as amount of pitch bend or degree of vibrato).

9.1A MIDI Hardware

MIDI-compatible devices usually include both MIDI in and MIDI out jacks, which terminate in 5-pin "DIN" connectors. The MIDI out jack transmits MIDI data to another MIDI device. As you play a MIDI controller such as a keyboard, data corresponding to what you play exits the MIDI out jack. *Example:* if you play middle C, the MIDI out transmits a piece of data that says "middle C is down." If you release that key, the MIDI out transmits another piece of data that says "middle C has been released." If the keyboard responds to the dynamics of your playing, the note data will include dynamics information too. Moving the modulation wheels and pedals attached to many synthesizers will also generate data associated with the wheel or pedal being used.

The MIDI in jack receives data from another MIDI device. In addition to the type of performance data described above, rhythmically-oriented MIDI devices *(e.g.*, drum machines) can often transmit and/or receive additional MIDI timing messages that keep other rhythmically-oriented units in a system synchronized with each other.

An optional MIDI thru jack provides a duplicate of the signal at the MIDI in jack. This is handy if you want to route MIDI data appearing at one device to another device as well. The SR-

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16's MIDI out jack can be switched to a thru function that merges MIDI in data with SR-16 MIDI data.

9.1B About Sequencing

Sequencing, the computerized equivalent of tape recording, is a very common and popular MIDI application. The SR-16 is a special-purpose sequencer optimized for drum machine applications.

Sequencing takes advantage of the fact that MIDI data can be time-stamped with rhythmic data and recorded in computer memory. The computer acts like a recorder, but instead of recording audio, it stores digital data that represents the pads you played, the exact order in which you played those pads, and the pad dynamics.

Once stored in memory, the performance can be played back. The principle is the same as a player piano, but instead of having keys triggered by holes in a roll of paper, drum sounds are triggered by data contained in the computer's memory.

The SR-16 also works well as a drum sound expander module for separate stand-alone or computer-based sequencers. Each of MIDI's 16 available channels can carry a unique set of MIDI data. Since all this data travels over one cable, each piece of data includes its appropriate channel ID so that MIDI receivers can "tune in" to a particular channel and accept only that data. The SR-16 can tune in to the channel that plays drum notes, and respond by triggering sounds.

9.2 MIDI CHANNEL MESSAGES

There are two main types of MIDI messages. Channel messages, which are channel-specific, consist of Voice and Mode messages. System messages, which do not have a channel number and are received by all units in a system, include Common, Real Time, and Exclusive messages.

9.2A Voice Messages

Playing a pad on the SR-16 produces the following MIDI data:

Note On Corresponds to the pad's assigned MIDI pitch; values can range from 000 (lowest note) to 127 (highest note). Middle C is 60.

Note Off This indicates the end of the note.

Velocity Corresponds to the dynamics of your playing; values range from 001 (minimum velocity) to 127 (maximum velocity).

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9.2B Mode Messages

There are two messages that determine the MIDI mode *(i.*e., how devices will receive MIDI data). The "omni" message determines how many channels will be recognized. Omni on means that data from all channels will be received; Omni off limits the number of channels, usually to one.

The "mono/poly" message deals with voice assignment within the synthesizer. In Mono mode, only one note at a time plays in response to voice messages; in Poly mode, as many voices can play notes as are available to play notes.

The SR-16 offers the following:

Omni On/Poly (Mode 1) The SR-16 responds to MIDI data occuring on any channel.

Omni Off/Poly (Mode 3) The SR-16 is tuned to one channel and ignores other channels.

9.3 SYSTEM COMMON MESSAGES

Intended for all units in a system, some of these messages are:

Song Position Pointer This indicates how many "MIDI beats" (normally a 16th note) have elapsed since a piece started (up to16,384 total beats). It is primarily used to allow different sequencers and drum machines to auto-locate to each other so that if you start one sequencer, the other device will automatically jump to the same place in the song, whereupon both continue on together.

System Exclusive This message (called sys ex for short) is considered "exclusive" because different manufacturers send and receive data over MIDI which is intended only for that manufacturer's equipment. *Example:* sending an Alesis SR-16 message to an Ensoniq VFX-SD or Roland MT-32 won't do anything but will be understood by other SR-16s. This data often contains information about individual instrument patches (such as the SR-16 Pattern/Song/Drum Set information).

Timing Clock The SR-16 emits 24 timing messages per quarter note. Each device synchronized to the SR-16 advances by 1/24th of a quarter note when it receives the clock message, thus keeping units in sync after they've both started at the same time. However, note that to provide an internal resolution of 96 timing messages per quarter note, the SR-16 internally subdivides the MIDI clock by a factor of four.

Start Signals all rhythmically-based units when to start playing.

Stop Signals all rhythmically-based units when to stop playing.

9.4 BOOKS ON MIDI

There have been many books written on MIDI; the following are just a few examples of what's available.

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MIDI For Musicians and *The Electronic Musician's Dictionary* by Craig Anderton; AMSCO Publications. The former was written specifically for musicians with no background in MIDI, and the latter defines terms related to musical electronics.

Music Through MIDI by Michael Boom; Microsoft Press. An excellent text for those getting started with MIDI, synthesis, and related topics.

The Murphy's Law MIDI Book by Jeff Burger; Alexander Publishing. Emphasizes applications and problem-solving.

Using MIDI by Helen Casabona and David Frederick; Alfred Publishing. A general guide to MIDI with an emphasis on applications.

Understanding MIDI and *Understanding MIDI 2* by various authors; Amordian Press. A collection of MIDI-oriented articles from *Musician* magazine.

Descubriendo MIDI by José Valenzuela; Alesis Publishing. A thorough overview of MIDI in Spanish, suitable for beginners and/or advanced users.

9.5 VIDEOS ON MIDI

The Basics Of MIDI featuring Craig Anderton with Steve Smythe; Alesis Publishing. An overview of the concepts and applications of the MIDI interface. Available through Alesis Command Performance Accessory Collection.

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ALESIS SR-16 TROUBLESHOOTING CHART

Symptom	What's Wrong	What To Do
No display.	Power switch not on. Power supply not connected. Bad power supply. Improper supply.	Push power switch in. Check Power supply connections. Try known good power supply. Try known good power supply. Power supply must be 9-12V A.C. A 9 volt D.C. supply won't work, but it won't harm the unit.
Buttons have no effect. LCD reads "Software Error". LCD shows nonsense, all lights on, or unit has lost all memory.	Software values are out of range (unit has "crashed"). As with all computing devices, crashes can be caused by any loss ot power while the unit is NOT sitting idle. Machine is in idle when in either the Pattern or Song select pages (i.e., not playing or recording). Crashes can also be caused by errors during tape loads or corrupted MIDI sys ex loads. It is recommended that data be saved and verified trequently to prevent losses of large amounts of data.	Reinitialize software. Turn power on while holding down "ERASE" and PLAY".
No sound.	Volume knob at minimum. Bad audio cable(s). Pads set to wrong outputs. Miv volume too low.	Turn knob clockwise. Replace with known good cable(s). Check Drum Set setup for proper output selection. Check Drum Set and increase mix volumes it necessary.
Sound is distorted.	Mix volume(s) set too loud. SR-16 output level is too high and is overdriving receiver input.	Check Drum Set and decrease mix volume(s) if necessary. Reduce overall volume or reduce drum set mix levels.
Drums don't "pan" in stereo field.	Drum set panning parameters are set incorrectly. Bad audio cable(s). Effects processors or mixing consoles being used in conjunction with the SR-16 are corrupting the stereo mix.	Set Drum Set panning as per section 4.4. Check cables by replacing with known good cables. Isolate and correct the problem.
One or more pads not working.	Improper output selection. Bad audio cable(s). Pad's mix level is set to 00. Panning not correct.	Check Drum Set parameters tor correct output selection. Check cables by replacing with known good cables. Check Drum Set parameters tor correct mix level. Check Drum Set parameters tor useful pan position.
Drums don't play back as recorded. Some beats seem shifted.	Quantize values not set correctly.	Check quantize and swing values in RECORD SETUP.
Won't display certain drum beats in step edit mode.	"	"
Pads not touch sensitive.	Pad dynamics set to fixed volume.	Check pad velocity parameters in RECORD SETUP.
Other sequencers won't "slave" to the SR-16.	SR-16 "Clock Out" turned off.	Turn the SR-16's "Clock Out" on.

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Other sequencers won't slave... (cont'd)	Sequencer not set to receive MIDI (external) clock.	Set slave's clock in accordingly.
SR-16 won't slave to other sequencer.	SR-16 "Clock In" turned off. Master sequencer not sending clock information. Unit in MIDI chain not passing on clock information.	Turn SR-16's "Clock In" on. Set master sequencer clock source accordingly. Turn MIDI echo on on each individual unit in the chain.
SR-16 not responding to Program Changes.	"PRG CHNG" turned off. SR-16 is not in Pattern mode. Incorrect MIDI channel.	Turn it on (MIDI SETUP button). Switch to Pattern mode. Set MIDI channel accordingly.
SR-16 not sending MIDI notes.	SR-16 "Drum Out" turned off. Incorrect MIDI channel.	Turn it on. Set channel accordingly.
SR-16 not receiving MIDI notes.	SR-16 "Drum In" turned off. Incorrect MIDI channel. Incorrect drum note assignments.	Turn it on. Set channel accordingly. Set drum notes accordingly.
Won't load from tape. **Note: Be sure to verify all saves immediately.**	Record and/or playback level incorrect. Bad cable OR Adapter plugs or cable setup contains built-in attenuator (resistance). Bad tape. Tape heads dirty. Noise reduction turned on.	Adjust levels for best results. 0dB is a good starting point for most tape recorders, however, some experimentation may be necessary. Check cables (plugs should be mono 1/8" mini plug). Avoid adapter plugs and make sure that cable is non-attenuating. Try new tape. Tape should be normally biased. Clean tape heads. Turn off all tape noise reduction.
Won't reload MIDI sys ex data dump from external disk drive or computer.	Disk drive's buffer memory is too small to hold the entire contents of the SR-16. Disk drive or computer did not correctly store original information.	Reduce the amount of memory in the SR-16 by erasing unneeded parts. Check operational procedures for storage and retrieval in the storage unit's manual. The SR-16 is designed to send and receive generic, unchannelized, one way (no handshake) sys ex data.
SR-16 won't receive one Song or Pattern.	This usually happens when trying to receive one Song or Pattern into a low numbered memory location when the SR-16 is very full. This is due to the internal storage format of the SR-16.	Retrieve Pattern or Song into a higher numbered Pattern or Song memory location. Or, reduce the amount of memory used by the SR-16 by erasing unneeded Patterns.

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